

2013

Collaborative blended learning with higher education students in an Arabic context

Omar Abdulwahab Al-Ismaiel

University of Wollongong

Recommended Citation

Al-Ismaiel, Omar Abdulwahab, Collaborative blended learning with higher education students in an Arabic context, Doctor of Philosophy thesis, Faculty of Education, University of Wollongong, 2013. <http://ro.uow.edu.au/theses/3983>

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library: research-pubs@uow.edu.au

UNIVERSITY OF WOLLONGONG

COPYRIGHT WARNING

You may print or download ONE copy of this document for the purpose of your own research or study. The University does not authorise you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site. You are reminded of the following:

Copyright owners are entitled to take legal action against persons who infringe their copyright. A reproduction of material that is protected by copyright may be a copyright infringement. A court may impose penalties and award damages in relation to offences and infringements relating to copyright material. Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.

**UNIVERSITY OF
WOLLONGONG**



Faculty of Education

**Collaborative Blended Learning with Higher Education Students in
an Arabic Context.**

Omar Abdulwahab Al-Ismaiel

**This thesis is presented as part of the requirements for the
award of the Degree of PhD
at the
University of Wollongong**

October 2013

ABSTRACT

In Saudi Arabia, online learning is still a relatively new concept in higher education. There is limited research investigating online collaborative learning environments which examine social interactions between students. The purpose of this study was to investigate student collaboration in Saudi higher education through the use of online collaborative tools, which were selected to compliment the face-to-face experiences traditionally offered. This study examined how these online tools may support student learning through group tasks orchestrated and completed within an online learning environment.

Throughout the two iterations of this study, particular attention was paid to contextual and cultural factors that may potentially support or hinder student learning in blended learning environments. Two cohorts of fifteen male education students in a first year IT class at King Faisal University (KFU) in Saudi Arabia participated in this study over two iterations (each bound by a teaching semester of fifteen weeks).

A design-based research approach (Reeves, 2000, 2006) was used to organise and report on the two iterations. Qualitative research which included observations and interviews, as well as action research, were employed to collect and analyse data from the two cohorts. The students were observed to examine their interactions while completing the two collaborative tasks in the online learning context. They were also interviewed (preliminary, second, and post interviews) by a Teaching Assistant to explore their cultural/social backgrounds and beliefs regarding technology, and to investigate difficulties with technology and collaboration, and personal factors that have affected their use of technology.

This study revealed that the participants found it difficult to deeply engage in the processes of online collaboration to complete their tasks. They did not make meaning or demonstrate understanding of the tasks within their discussions through their engagement with the online tools. The discussion forum was the most used tool, followed by the chat tool and then the email tool.

Cultural and contextual factors affected student learning in the online environment. Cultural factors were found that limited students' meaning-making and engagement in collaboration. These factors included their preference for face-to-face learning, and a lack of experience in engaging in collaborative learning and using online tools for learning. Contextual factors that limited student collaboration and interaction through the online collaborative tools included difficulties with technology and previous group work experience.

In conclusion, student collaboration through online tools did not support the students to advance their understanding while completing the collaborative tasks. Cultural and contextual factors were found to affect online collaborative learning. This study suggests that subject content should be appropriate for use with the specified online collaborative tools, and that online collaborative tools in a Saudi higher education context should be simple and adaptable to the prevalent traditional and cultural norms. Collaborative blended learning environments present new considerations for teaching and learning in Saudi Arabia and need continued research attention.

Acknowledgements

I would like to sincerely thank my previous supervisors, Associate Professor Tony Herrington and Dr Nicola Johnson for their support and encouragement for the first step of my research. In addition, I would like to sincerely thank my two supervisors, Associate Professor Lisa Kervin and Dr Sarah Howard. Their continuous scaffolding, patience, encouragement, and support during this research were sincerely appreciated.

I would also like to thank all of the people involved in this research for their contributions; the student participants, Teaching Assistant, and staff at King Faisal University. Special thanks to the University of Wollongong and its staff for their support as well as the Saudi Cultural Mission for financial support. I gratefully thank Dr Meeta Chatterjee-Padmanabhan for her academic support during my journey, and my colleague and closest friend, Maher Aljuwaiber, for his emotional support, encouragement, and honest friendship.

Finally, I would like to thank my mother, wife, son, brothers, sisters, and friends for their constant prayers and support throughout this research and my journey.

Dedications

This thesis is dedicated to:

My Father, Abdulwahab

May Allah show mercy upon him.

My Mother, Shuaa

Thank you for your prayers, encouragement, endless inspiration, and continuous support that allowed me to complete this work.

My Wife, Hessa

Thank you for your patience, encouragement, and understanding during this long journey made possible by you.

My son, Abdulwahab, and my brothers, sisters, and friends for their encouragement and support.

TABLE OF CONTENTS

Abstract	i
Acknowledgements and Dedication	iii
Table of contents	iv
List of figures	vii
List of tables.....	viii
 1. Introduction and Background	1
Introduction	1
Purpose of the study	1
Research questions	2
Significance of the study.....	2
Background to the study	4
General education in Saudi Arabia.....	7
Personal orientation to the study.....	8
Locus of the study	10
Definitions of key terms.....	12
Limitations of the study	13
Thesis overview	14
 2. Literature Review.....	16
Introduction	16
Collaborative learning	17
Online and blended learning.....	23
Online learning in higher education	27
Nature of culture	33
Higher Education in Saudi Arabia	46
Teaching in Saudi Higher Education.....	48
Summary	54
 3. Methodology	55
Introduction	55
Research Questions	55
Research Design.....	56
Methodology.....	56

Research Approach	58
Action research	66
Research procedures	69
Data collection methods	72
My background as a teacher and researcher	78
Iteration 1	79
Iteration 2	83
Data analysis methods	87
Triangulation and validity	89
Summary	90
4. Descriptions of the Iterations	92
Introduction	92
Iteration 1	100
Iteration 2	106
Summary	113
5. Findings: Iteration 1	114
Group and task backgrounds	114
Iteration 1	115
Group A/Task 1	115
Group A/Task 2	126
Group B/Task 1	133
Group B/Task 2	143
Group C/Task 1	148
Group C/Task 2	158
Group D/Task 1	163
Group D/Task 2	172
Group E/Task 1	179
Group E/Task 2	188
6. Findings: Iteration 2	195
Introduction	195
Group E	196
Second iteration focus: Collaborative group roles	197
Group E/Task 1	200

Group E/Task 2	212
Summary	220
Second iteration focus: Student interpretations of the tasks	221
Group E/Task 1	222
Group E/Task 2	230
Summary	236
Second iteration focus: Issues of communication	237
Summary	249
7. Discussion.....	250
Introduction	250
Discussion of Research Question 1	250
Discussion of Research Question 2	260
Contextual factors	260
Cultural factors	263
Principles for the use of collaborative tools in Saudi higher education.....	271
Recommendations for practice	275
Recommendations for future studies	276
Conclusion.....	277
References	279
 Appendices	
Appendix 1: Information sheet (example)	298
Appendix 2: Consent form (example).....	300
Appendix 3: Collaborative tasks	302
Appendix 4: Audit Trail for the two iterations.....	306
Appendix 5: Subject aims, learning outcomes, and details.....	312
Appendix 6: Group E's analysis of collaborative tasks.....	317
Appendix 7: Transcription of Group E's final product/Task 2.....	322
Appendix 8: Group E's transcription of the chat tool/Tasks 1 & 2	324
Appendix 9: Group E's transcription of the journal tool/Task 1	329
Appendix 10: Interview guide for the student interviews.....	331
Appendix 11: Information sheet (Arabic).....	332
Appendix 12: Interview guide for student interviews (Arabic)	333

LIST OF FIGURES

Figure 3.1- Design-Based Research	59
Figure 3.2- The Process for Action Research within a DBR framework.	68
Figure 3.3 – Design of iterative cycle 1.	82
Figure 3.4 – Design of iterative cycle 2.	86
Figure 4.1- Blackboard tools.....	96
Figure 4.2- Discussion forum.....	97
Figure 4.3- Email tool.	98
Figure 4.4- Chat tool.	99
Figure 4.5- Journal tool.	100
Figure 6.1- The teacher's description of how to create a website	207
Figure 6.2- Definition of technology and its rationale on group E's website	209
Figure 6.3- Advantages and disadvantages of technology on group E's website....	210
Figure 6.4- Examples of technological tools in Education on group E's website. ..	211

LIST OF TABLES

Table 2.1 IC differences in the learning environment.....	36
Table 2.2 PD differences in the learning environment.	37
Table 2.3 UA differences in the learning environment.....	38
Table 2.4 MF differences in the learning environment.....	39
Table 2.5 Long/ Short-Term Orientation social norm.	40
Table 2.6 Differences in communication in the learning environment in high-and low-contextual cultures.....	42
Table 3.1 Observation checklist.....	73
Table 3.2 Topics of interviews.....	76
Table 3.3 Collaborative tasks of the course	77
Table 3.4 Class activities.....	80
Table 3.5 Analysis of research questions	88
Table 4.1 Topics of the lectures.	93
Table 4.2 Solutions to address the redesign of Iteration 2	107
Table 5.1 Frequencies of the codes based on the group members interactions.	117
Table 5.2 Frequencies of the codes based on the group members interactions.	127
Table 5.3 Frequencies of the codes based on the group members interactions.	134
Table 5.4 Frequencies of the codes based on the group members interactions.	143
Table 5.5 Frequencies of the codes based on the group members interactions.	149
Table 5.6 Frequencies of the codes based on the group members interactions.	158
Table 5.7 Frequencies of the codes based on the group members interactions.	164
Table 5.8 Frequencies of the codes based on the group members interactions.	172
Table 5.9 Frequencies of the codes based on the group members interactions.	180
Table 5.10 Frequencies of the codes based on the group members interactions.	188
Table 6.1 Frequencies of the categories based on the group members interactions.	200
Table 6.2 Frequencies of the categories analysed based on the group members interactions.....	212
Table 6.3 Frequencies of using the online tools for Task 1.	239
Table 6.4 Frequencies of using the online tools for Task 2.	241
Table 6.5 Cultural/social and contextual factors of students' communication.....	245

Chapter 1

Introduction and Background

Introduction

Globally, many universities are moving towards utilising online environments and collaborative tools as an extension of the classroom to support student learning. These blended learning environments are bringing with them a new set of challenges for both teachers and students. Online collaborative learning is identified as a strategy that provides students with high levels of interaction to support their learning (Johnson & Johnson, 2004; Resta, Awalt & Menchaca, 2002). Despite the global push for online learning, it is still a new concept in Saudi Arabian education (National Centre for E-learning and Distance Learning, 2010), with a lack of research investigating online collaborative learning environments that examine social interactions between students in a higher education context.

Purpose of the study

The purpose of this study is to investigate student collaboration in Saudi higher education through the use of online collaborative tools that compliment the face-to-face experiences offered. This study aims to examine how these tools may support student learning through group tasks orchestrated and completed within an online learning environment. Throughout the two iterations of this study, particular attention is paid to contextual and cultural factors that could potentially support or hinder student learning in the blended learning environment.

In order to achieve this, the study:

- Investigates frameworks for using collaborative learning in an Arabic context which incorporates pedagogy involving collaborative strategies such as online discussion and social interaction.
- Designs and implements online learning environments for higher education students to allow interactions through participation in collaborative activities in a blended learning course.
- Examines higher education students' learning in a collaborative blended learning environment through two iterations.

Research questions

This study is framed by the following key questions:

- *How can collaborative tools support students' learning in a higher education technology subject in Saudi Arabia?*
- *What are the contextual and cultural factors that support or inhibit students' learning in a blended learning course in Saudi Arabia?*

Significance of the study

Significance of culture

To the best of my knowledge, this study was unique in that it examined cultural factors that support or inhibit student learning in Saudi higher education, and how these cultural factors influence students' use of online tools, especially collaborative tools for learning in conservative society such as Saudi Arabia which relies mostly on traditional learning environments. This study attempts to examine the adoption of online tools within one tertiary level subject across two iterations, with particular emphasis on collaborative tools within the learning environments, to see what the experience for the students was like. Online collaborative tools that are used

extensively globally were selected for inclusion in the online environment. The specific focus on the students' use of these tools within their cultural context presents a unique perspective for educational technology research.

Significance for students

This study introduced the students to blended learning, a new model of learning in Saudi higher education. It draws from the premise that opportunities to collaborate using online tools is supportive to the teaching and learning experience. In doing so, this research took into consideration student interests, experience, and aptitude with the use of technology and online tools. This study presented an opportunity for students to engage with and practice collaborative activities designed to encourage interaction with others as they engaged with online experiences which were designed to encourage the students to share knowledge and work to new understandings. Doing this in a blended learning environment aimed to provide students with the support of the known traditional classroom and teaching methods while they also engaged with an interactive learning environment.

Significance for practice

Saudi Arabia, like many countries, is experiencing unprecedented demand on higher education due to demand for tertiary qualifications. This study attempted to examine a new learning structure (using the Internet to disseminate a learning environment) that may help with meeting demand as more efficient ways to use resources are considered. This study utilised a blended learning environment to foster collaborative learning to reduce the dependence on teacher-centre learning and provide interactive learning opportunities to enhance meaningful interaction between and among students as well as with the teacher. This study works towards sharing a learning model of interest to educational decision makers and instructional designers in the Saudi higher education context to help incorporate online tools within the more

traditional educational content. This incorporation helps in improving learning outcomes and attracting students to interesting and useful content.

Background to the study

In examining the Saudi student collaboration in the online learning environment, and exploring contextual and cultural factors that support or inhibit their learning in a blended learning environment, it is useful to understand the context of Saudi Arabia including Internet access, family lives and religion, technology in the home, and general education.

The country

The Kingdom of Saudi Arabia is the biggest country in the Middle East. It was established by King Abdul Aziz Bin Saud in 1902. Islam is the religion of Saudi Arabia and the native language is Arabic. According to The Central Department of Statistical and Information of Saudi Arabia (2010) the population is 27.137 million, and it has one of the fastest population growth rates in the world (Alanazy, 2011). "Saudi Arabia is a large country which occupies almost four-fifths of the Arabian Peninsula with an area of 1,960,582 million square kilometers or 784,233 square miles, which is approximately the size of Western Europe or one-fourth the size of United States" (Osilan, 2009, p. 24).

Internet access

It seems that the appearance of the Internet into Saudi society has occurred slightly late (Alaugab, 2007). "The Internet is relatively new in the Middle East, but it is getting much attention from individuals, institutions, businesses, educational institutions and governments" (Al-Fulih, 2002, p. 27). Across all Arabic countries, it was estimated that there were 1.5 million Internet users by the end of 1999 and this

number increased to more than 12 million Internet users by 2002. However, Al-Fulih (2002) estimates that the annual growth rate of Arab Internet users will reduce after 2002 because the Internet providers cannot provide satisfactory Internet access in these countries due to infrastructure difficulties. The government of Saudi Arabia has regulated filtering process across the whole country to ensure that the Internet content accessed is consistent with religious, legal, traditional and cultural norms of Saudi society (Al-Furaih, 2002).

It seems that the use of technology in Saudi higher education is still limited (Al-Fulih, 2002; Al-Wehaibi et al., 2008). This limited adoption of technology specifically Internet in teaching and learning could refer to some issues around accessibility such as the lack of English language and Internet access, technology skills and computer literacy, infrastructure and technical support, limited financial support for teacher training and online learning (Alaugab, 2007). The ministry of Higher Education in Saudi Arabia has essential aims to provide technologies and the required training for online instruction. However, the implementation of online courses in Saudi universities is still at the early stages (Alanazy, 2011). This could refer to the teachers' beliefs in teacher-centred approaches.

Family lives and religion

Religion and family have a great impact on the Saudi society's members. "The influence of Islam has been the most sustaining element in Saudi Arabia" (Osilan, 2009, p. 24), and most of the characteristics of the Saudi family reflect it. Islam is a "religion based upon knowledge, for it is the ultimate knowledge of the Oneness of God combined with faith and total commitment to Him that saves man" (Islam and Knowledge, 1989, p. 20). The followers of Islamic religion are called Muslims. Muslims follow the instruction of the Quran (The holy book for Muslims) and the Hadith (The texts of saying and actions of Prophet Mohammad). Islam emphasises the importance of the family as it is the base of the society and the responsibility of humans to give birth to new generations. This teaching confirms the family as the

foundation for humans. "Close-knit extended family is considered the norm, and one might find not only multiple generations in a single household, but also married, adult siblings and their families all living together" (Al-Keaid, 2004, p. 126).

In this environment, the oldest adult male is the leader of the family who could be a father, uncle or brother to the family members. The other members of the family follow his guidance regardless of their gender or age. Some members of the family would be autonomous in their own houses. The degree of autonomy of the member of the family is determined by the leader of the family (Al-Keaid, 2004). The people's lives in Saudi Arabia are more influenced by Islam than any other of Islamic countries due to the presence of holy places. Saudi Arabia is described as a conservative culture with a highly restricted society (Saleh, 1998; Osilan, 2009).

Particular roles of the family have been established by Islamic law. The family directs all its members in addition to socialising and educating the new generations (Saleh, 1998; Osilan, 2009). The family is the main unit that prepares children with the necessary resources that help them succeed in school and society. Within the home context, parents provide physical and emotional supports for their children, and also provide them with the tools and models that help them learn how to read and write. Parents help their children build literacy by reading aloud to their children and making sure that their children see and hear them reading. Therefore, this literacy is initially learnt within the family circle.

Technology in the home

Technology has had an important role in changing many societies as it contributes to facilitating various functions and participates in the development process. The transfer of technology to Saudi families is determined by its appropriateness to society, which should always be in line with social and cultural considerations, specifically to the values of Islam (Al-Fulih, 2002; Osilan, 2009). This means that some Saudi families might resist technologies such as computers, laptops and

networks in their own homes as they believe that these technological tools contain some items related to alcohol, gambling, drugs or pornography which are not aligned with Islamic principles. This resistance to change could also be for other reasons. Tozer (1997) illustrates some factors that may hinder the implementation of change including:

ingrained norms and habits, lack of confidence, fear of failure, lack of understanding the reasons why, threats to status, perception of self/others, fear of loss, fear of unknown, lack of social proof, conflicting priorities, confusion, unclear benefits, fear of redundancy or lack of skills, lack of information, and lack of motivation (p. 256).

While there are some concerns regarding internet use, Saudi families do use home computers to boost students' academic accomplishment. Aljuwaiber (2009) conducted a study to understand the effect of home computer use on students' learning in a computer science course in Saudi Arabia. The study found positive correlation between the use of home computers and student learning. Aljuwaiber's (2009) study found that the most important limiting factor stopping families from having computers was socio-economic.

General education in Saudi Arabia

School in Saudi Arabia

General education in Saudi Arabia is divided into three levels: primary, intermediate and secondary (high) schools for both boys and girls. When enrolling in secondary (high) school, students are able to choose areas of concentration: Arts, Sciences or Vocational schools. Saudi's students must pass national standardised exams to enrol in university.

Technology in schools

The Ministry of Education in Saudi Arabia is currently working through a ten year plan (2003- 2013) which is based on the previous plan (1999-2002) to develop education and improve learning environments for all students and teachers. This plan aims to provide students with the required knowledge, behaviours, skills and experiences to be confident in responding to new inventions in science and technology. In addition, this plan aims to create a dynamic educational system to prepare students to participate in international competitions in the areas of science and practice, and to ascertain and sustain their perceptions and capabilities. A key goal of this plan is to foster students' motivation and provide them with the support toward work in an interactive learning environment (10 Year Plan, 2003). Although this has been a central focus on the educational system in Saudi Arabia, instruction still relies on traditional approaches with rote learning remaining a common practice.

Personal orientation to the study

Reading and analysis of literature as well as personal reflection on my own teaching experience play a fundamental role in introducing this study. The analysis of literature during personal postgraduate study with connection to my experiences as a teacher in primary school and in the higher education context have shaped my perspective of Saudi higher education. It has made me determined to reach a deeper understanding of how to enhance tertiary student learning.

I have learned that learning is directly influenced by the learning environment, as different research studies have emphasised that student learning improvements were relevant to positive learning settings (Fraser, 2001; Fraser & Fisher, 1994). This could refer to the teachers' and students' beliefs and performances in the learning environment (Molenda & Boling, 2008). Based on the recent literature, many studies have focused on the importance of online learning in higher education that provides flexibility of communication, access to the course materials, and learning resources

to students (Appana, 2008; Chang & Fisher, 2003; Graham, 2005). In Western countries, online learning is extensively used in most institutes of higher education. For example, 3.9 million students were enrolled in one online course in the USA in 2007 (Allen & Seaman, 2008).

Collaborative learning is a learning strategy that enables social interaction between students in groups (Roberts, 2004). This strategy has been given special attention by many researchers of online learning environments. Online collaborative learning is where students are allocated to groups for mutual communication and interaction via the Internet (Roberts, 2005). Studies have shown the benefits of using online collaborative learning such as improving student skills, supporting student participation and interaction, and providing opportunities for knowledge construction (Chapman, 2005; McInerney & Roberts, 2004; Stacey, 1999). However, this is not the case in Saudi Arabia where students learn in traditional face-to-face classrooms.

Based on my teaching experience, students engage in conventional learning environments as passive learners in all levels of education in Saudi Arabia. In these environments, the teacher is only responsible for student learning and has the authority to provide knowledge for students (Al-Keaid, 2004). These learning environments limit the opportunity for Saudi Arabian students to engage in interactive and collaborative learning environments. In Saudi Arabia, the National Centre for E-learning and Distance Learning (NCEL) was founded by the Ministry of Education in 2006 to encourage universities and institutions to initiate online courses and programs (NCEL, 2010). However, the use of online learning is still new in Saudi Arabia (Alanazy, 2011). This study aimed to investigate tertiary students' collaborative learning in Saudi Arabia and how collaborative tools could support their learning. It also attempted to examine contextual and cultural factors that support or inhibit their learning in a blended learning environment.

Locus of the study

This study was based in the Faculty of Education at King Faisal University, Saudi Arabia. The University is located in Al-Hofuf city. This city is situated on the urban centre in the Eastern Province of Saudi Arabia and it is the closest city to a famous oil field called Ghawar. It is also one of the main agricultural centres in Saudi Arabia with several agricultural resources such as palm cultivation, production of vegetables and fruit, and livestock projects.

King Faisal University (KFU)

King Faisal University (KFU) was established in 1975. The Saudi government established the first phase of the new campus of KFU in 1998. The number of students increased from 170 in 1975 to more than 23,909 male and female students in 2010. Male and female students study separately at separate campuses due to religious and cultural reasons, although some male lecturers teach female students through direct broadcasting services. The number of faculty members, lecturers and teaching assistants increased from 46 to 1379 members in 2010, including 651 Saudi members. The number of administrators, technicians, and labourers increased from 166 in 1981 to 1387 in 2010. In addition, the number of university graduates increased from 9 students in 1979 to 13,876 graduates (males and females) from different disciplines such as Agricultural Science, Medicine, Education, Business, Administrative Science, Veterinary Medicine, and Animal Resources. This number of graduates included 641 students (males and females) from Islamic and Arabic countries.

The Deanship of Library Affairs provides an electronic library at KFU. This service is available to facilitate national and international information with an up-to-date collection of resources in all the required fields for both students and academic staff members. The databases include encyclopedias and books, national and international theses and dissertations, Arabic and English periodicals, and local newspapers. KFU

has also paid special attention to conferences; it organised more than 66 conferences relating to local and global issues. In addition, KFU participated in more than 300 local and external conferences and seminars which were represented by KFU faculty members. KFU has different scientific research centres. These centres host more than 40 national research projects relevant to the economy and the environment. These centres published more than 2000 scientific research articles in local and international journals.

Framework for e-learning at KFU

The Deanship of E-learning was established at KFU in 2009 to supply all electronic services such as building up infrastructure, providing electronic learning resources and learning systems, and providing training to use these systems. The deanship offers advanced e-learning systems for lectures. These e-learning systems are Blackboard/WebCT, Virtual Classroom Systems, Class Capturing/Recording Systems, Authoring Tool and Content Management Systems, and Online Exam Systems. These systems are provided to allow teachers to create, deliver and manage web-based components of e-courses. They allow students to participate in live classes and electronically practice their activities and make every class available anytime or anywhere by automatically recording, uploading and indexing it. These systems provide both teachers and students with a comprehensive authoring environment for creating and delivering interactive multimedia content such as audio, video, images, and animations. They also enable teachers in managing, authoring, scheduling and delivering surveys, quizzes and exams.

Faculty of Education

The Faculty of Education at KFU consists of eight departments across male and female campuses. These departments are Special Education, Physical Education, Artist Education, Kindergarten, Curricula and Teaching Methods, Education and

Psychology, Educational Management, and Education Technologies. There are more than 160 academic staff members (males and females) who teach male and female students in these departments. I am an academic staff member in the Education Technologies department and my present study will serve the department to prepare future teachers in employing effective teaching strategies and technologies for educational purposes.

Students who are enrolled in this faculty should study 132 credit points to meet the faculty requirements and obtain a Bachelor's degree of Education. This faculty also offers Masters degrees (2 years) in: Psychological Guidance and Counseling; Applied Linguistics (English); Arabic Language; and Educational Administration. Lectures are the main delivery method being employed by the faculty. In this environment, students experience face-to-face instruction with little use of the computer labs. Most of the teachers deliver their subject content using the lecture method over fifteen weeks of each semester. A typical subject includes a new topic every week, a mid-session exam, and a final exam at the end of the semester.

Definitions of key terms

Blended learning environment

The integration of online tools into traditional courses. This learning environment can also be referred to as a mixed learning environment (Graham, 2005; Masie, 2002).

Collaborative learning

A learning strategy that allows social interactions between students in groups involving a variety of activities such as problem solving, negotiation, and information sharing (Roberts, 2004).

Online collaborative learning

A learning setting where students are divided into groups to learn and communicate with each other through the Internet (Roberts, 2005).

Blackboard (Bb system)

A learning management system for classrooms and online learning environments. It has become the "dominant e-learning software company" (Bradford, Porciello, Balkon & Backus, 2007, p. 301) because it includes many tools to support teachers, course designers, and students (Bradford et al., 2007).

Synchronous and asynchronous online learning

Synchronous online learning supports real-time communications between students and their peers, and with their teacher. These communications occur via synchronous online tools such as a chat tool. On the other hand, asynchronous online learning enables communications between students and with their teacher at different times through asynchronous online tools such as email and discussion forums (Holden & Westfall, 2006).

Limitations of the study

This study has three potential limitations. The first limitation was that the sample used was only male student participants from one university (KFU) in one region of Saudi Arabia. Sampling mixed-gender students from more than one university in more than one region would enhance the generalisability of the study and enable us to reach a deeper understanding of Saudi students learning in online collaborative learning contexts and the cultural issues that could impact upon their learning. The second limitation was that only qualitative methods of data collection were used in

this study to address the research questions. Using mixed methods design (qualitative and quantitative) in the study may have provided us with opportunities to obtain better data with more reliable results while decreasing the probability of biased findings (Teddle & Tashakkori, 2002). The final limitation of this study was that the findings may have been influenced by the participants' preferences for the use of the online tools in the blended learning environment. The findings indicated that most of the participants preferred to be engaged in face-to-face learning environments rather than online. However, some participants stated that online learning is motivating and more convenient. Therefore, these results could have been affected by participants' preferences.

Thesis overview

An orientation to the study has been presented in this chapter. Six further chapters make up this thesis.

Chapter 2 reviews and discusses the related literature. It focuses on collaborative learning and social interaction, online and blended learning environments, online learning in higher education, cultural differences based on Hofstede's (1980, 2001) dimensions of culture and the theory of intercultural communication (Hall, 1966, 1976), and teaching and learning in Saudi higher education.

Chapter 3 describes the methodology utilised in the research. The chapter discusses the research questions, the design of the study and the theoretical underpinnings that inform the study. Ethical issues, the type of online learning used, the two iterations of the study, and the methods of data collection and data analysis are identified. The participants of the two iterations and the process of data collection are also introduced. In addition, the methods of data analysis of this study are explained. Finally, triangulation and validity are explored in this chapter.

Chapter 4 describes the two iterations of the study including the subject taught to the participants, the blended learning environment, and the participants' backgrounds and their experiences. It also describes the redesign of the second iteration of the study as well as my reflections on the iterations.

The findings from the data analysis are presented in Chapters 5 and 6. The data was collected with reference to online tools and participant's cultural and social backgrounds. In Chapter 5, students' responses were recorded through observations and interviews (the first iteration). In Chapter 6, students' responses were recorded from an illustrative group (the second iteration).

The final chapter, Chapter 7, discusses the major findings in relation to the research questions and provides principles for the use of collaborative tools in Saudi higher education. This chapter also suggests possibilities for future studies.

Chapter 2

Literature Review

Introduction

This study aims to investigate student collaboration in Saudi higher education through the use of online collaborative tools selected to compliment the face-to-face experiences offered. This study aims to examine how these tools may support student learning through group tasks orchestrated and completed within an online learning environment. Throughout the two iterations of this study, particular attention is paid to contextual and cultural factors that could potentially support or hinder student learning in the blended learning environment. The purpose of this chapter is to examine the research literature related to the problem being investigated.

This chapter is divided into three main sections. The first section defines collaboration and how it relates to social interaction in order to enhance the design of online collaborative learning environments. It provides a discussion of online and blended learning environments as they emerge from the literature in Western higher education contexts. The literature on collaborative online learning in Saudi Arabia is limited. Getting an overview of the issues in Western and other higher education context can provide meaningful insight into how collaborative online learning can be encouraged in Saudi Arabia. The literature on online learning is also examined to understand its role in student learning. In Saudi Arabia, group work is rarely used as a strategy in the classroom to get students to understand something or solve a problem. Group work, as it emerges from the literature, seems to be a powerful means of enhancing student learning. Therefore, it is important to include it in classroom teaching. For this study, two questions have emerged from the literature related to this area. First, how can collaborative tools support student learning in a higher education technology subject in Saudi Arabia? Second, what are the contextual and cultural factors that support or inhibit student learning in a blended learning course in Saudi Arabia?.

The second section discusses the cultural differences based on Hofstede's (1980, 2001) dimensions of culture, and the theory of intercultural communication developed by Hall (1966, 1976) with the support of relevant research studies. This discussion describes individual learners in different cultures as outlined in Hofstede's (1980, 2001) research with a focus on Arab countries (the current study is in Saudi Arabia). This discussion provides a broad understanding of the culture role in implementing a specific collaborative online learning context.

The aim of the third section is to provide insights into the Saudi Arabian context. The literature on the use of online learning in Saudi higher education with its connection to teaching and learning, including the use of collaborative learning, are examined and discussed. In addition, the literature on online learning and its connection to cultural diversity is also explored and critiqued. From the literature on online collaborative learning and cultural differences, it appears that there is a limited body of empirical studies on collaborative tools to enhance student learning as well as cultural factors that support or hinder their learning in blended learning environments in Saudi Arabia. Thus, the current study was conducted in response to this gap.

Collaborative learning

Collaboration

This section begins to describe collaboration and how it can be defined in the learning environment with connection to social interaction. Collaboration between students, and interactions between teacher and students, is a fundamental part of learning (Bernard, Rubalcava & St. Pierre, 2000). Collaboration is defined by many researchers in different ways. It is defined as a process which brings people together to develop solutions to problems (Hansford & Wylie, 2002). Collaboration also can be defined as a learning strategy that considers social interaction as an aspect of knowledge construction (Bruffee, 1999). Collaborative learning is the social interaction amongst individuals that comprises a range of performances such as

communication, coordination, problem solving, negotiation, and information sharing (Roberts, 2004). This definition is adopted in this study to examine student collaboration through their interaction while completing the two collaborative tasks.

Collaborative learning is considered to be an effective method to enhance student learning and academic achievement compared to conventional instructional methods (Amey, 2010; Bennet, 2004; Turner, 2011). Many researchers tend to describe collaborative learning as students' social interactions to solve a problem or work on a task. It is defined by Roschelle and Teasley (1995) as "a coordinated synchronous activity that is the result of a continued attempt to construct and maintain a shared concept of a problem" (p. 70). Rose (2002) illustrates collaboration as "a learning and instructional approach typified by groups working together on a common learning task" (p. 6). The group members' interactions should support the collaborative group to meet mutual goals (Hathorn & Ingram, 2002a). An important part of the group members' contributions to solve a problem (learning task) within social interactions in collaborative learning environments is negotiation, which is "a process by which students attempt to attain agreement on aspects of the task domain... and on certain aspects of the interaction itself" (Dillenbourg, Baker, Blaye & O'Malley, 1996, p. 19). Collaboration can help learners develop a sense of shared learner goals and provide opportunities to negotiate or to communicate intensely about issues related to the problem. This facilitates a deeper understanding of issues.

Social interaction can include various approaches that engage learning with peers such as collaborative learning, authentic learning, and problem-based learning (Shunk, 2000). Collaborative learning can support construction of meaning. For instance, in collaborative learning environments, students learn how to negotiate and state their own viewpoints to their peers through social interaction. Therefore, they are able to anchor their own understanding and assimilate other opposing viewpoints (Conoley, 2010; Grabinger, 1996; Savery & Duffy, 1995). Social interaction between students can help them to construct knowledge about a subject and enhance their

problem solving ability on a task (Amey, 2010; Bennet, 2004; Bernard et al., 2000; Curtis & Lawson, 2001).

Theories of social constructivism suggest that collaboration is the basis of learning. Collaborative learning is based on Vygotsky's (1962, 1978) constructivist theory that emphasises the important role of social interaction in the process of learning which was laid down by the theory of "Zone of Proximal Development" (ZPD). Vygotsky's ZPD (1978) is a theory that highlights the social element of learning. Collaborative learning is supported by the social constructivism that stresses the significance of culture and context. This is similar to Vygotsky's (1962, 1978) concept of social cognition. "The major theme of Vygotsky's theoretical framework is that social interaction plays a fundamental role in the development of cognition" (Carter, 2005, p.9). Vygotsky assumes that learning occurs through a social interactive environment, among learners themselves, or between students and teachers. Johnson and Johnson (1996) describe promotive interactions to include:

giving and receiving help and assistance, exchanging resources and information, giving and receiving feedback on performance, challenging each other's reasoning, advocating increased efforts to achieve, mutually influencing each other's reasoning and behaviours, engaging in interpersonal skills and processing the effectiveness of the group (p. 1022).

Social interaction such as the ones mentioned help scaffold student learning. As discussed, collaboration is a social interaction among students working together on a task to solve a problem, share information, and construct knowledge. Context, construction, collaboration, and conversation play important roles to enhance social interaction in a collaborative learning environment (Jonassen, Davidson, Collins, Campbell & Haag, 1995). Thus, these dimensions need to be designed carefully to create a collaborative learning environment.

To facilitate collaboration, students should be able to construct their knowledge for purposeful collaborative learning within meaningful learning environments (Conoley, 2010; Fischer, Kollar, Mandl & Haake, 2007; King, 2007). According to

Jonassen et al. (1995) context, construction, collaboration, and conversation are the principles that can be used to support the creation of online collaborative learning environments. *Context* includes features of the learning task that need to be accomplished or learned. The features in the learning environment may contain physical, organisational, cultural, and social aspects relevant to the intended knowledge being learned. *Construction* of knowledge is gained by an active process through interaction and reflection within a context. The individual's experiences can facilitate knowledge construction in the context, if these experiences are used by the individuals or group members to make their own meaning in the learning environments. *Collaboration* occurs among learners throughout the learning process. It allows them to develop, examine, and evaluate various beliefs within the learning context. Learners are more likely to create new and amend present knowledge structures through the process of collaboration. *Conversation* is associated with collaboration and it is an essential element of the meaning-making processes. Individuals and group members should communicate and negotiate plans for solving problems. These plans may involve reflection on what the individuals know about the problems and what they need to know before commencing the plans.

Many researchers seem to agree about the subsistence of social processes and interactions between students that are involved in collaborative learning environments in order to build knowledge through collaborative discourse (Fischer et al., 2007; King, 2007; Stahl, 2006; Weingberger, 2003). These researchers claim that collaborative learning requires social support from the learners in which they can participate in the progression to solving a problem. They also suggest that collaborative discourse should be involved in collaborative learning contexts to construct knowledge. This discourse conceives different patterns of ideas that are able to be rephrased, responded to and generated. Scardamila and Bereiter (2006) further explain that knowledge construction could occur through collaborative conversation when the present knowledge statement is developed and the generation of new ideas is allowed in order to seek the appropriate solution of shared problems. They emphasise that knowledge can be constructed within collaborative discourse if

this conversation occurs in collaborative progress, and aims to look for widespread understanding and develop the base of accepted information. Therefore, knowledge can be built within the process of developing understanding as well as evolving facts from the interaction of plain components (Scardamila & Bereiter, 2006). In social interaction environments, students collaborate with each other in groups to construct knowledge through the exchange of ideas and perspectives in reciprocal dialogue. In this environment, students gain understanding throughout different mental processes including contextual and social factors that result in knowledge construction (Fischer et al., 2007). Hence, the relationship between student collaboration and social interaction is mutual (Fischer et al., 2007; King, 2007; Stahl, 2006; Turner, 2011).

Based on the principles illustrated by Jonassen et al. (1995), construction of knowledge is created in collaborative learning environments where learners are allowed to discuss, negotiate and reflect on present knowledge. It is important that students are provided with assigning a task or a problem in an appropriate context for the collaborative learning to occur. It also needs to be a vehicle to facilitate collaboration in context. Collaboration often occurs between students via conversation where individuals interact with each other in a group work environment. Researchers (Barab, Thomas & Merrill, 2001; Fischer et al., 2007; Jonassen et al., 1995; King, 2007; Scardamila & Bereiter, 2006; Weingberger, 2003) argue that knowledge can be constructed in a collaborative learning environment if it:

- Provides learners with opportunities to enhance *construction* of knowledge; by
- Creating a proper *context* for the intended learning; and
- Facilitating *collaborative learning* among students; via the use of
- *Conversation*

Therefore, the purpose of collaborative learning is for learners to work together as they share knowledge and their own views. To meet the significance of sharing

others' knowledge and views, there are five basic elements that should be included in a collaborative learning context (Johnson and Johnson, 2004). The elements are positive interdependence, individual accountability, promotive interaction, social skills, and group processing.

Positive interdependence indicates that the learners must realise that they need each other to be able to accomplish the group's task (Resta et al., 2002). They should also realise that each group member's work is required and necessary for group achievement and success. In addition, each group member has a unique role to play in the sharing effort due to his or her role, responsibilities, and resources. Therefore, students understand that their individual success is completely inter-related.

Individual accountability implies that the learners should be responsible for their own learning and that they are able to complete a task with or without their group. The purpose of collaborative learning is to involve every member of the group and involve them in all stages of task completion. This is important to ensure that all group members can take responsibility for their mutual work.

Promotive interaction means that the learners are able to enhance each other's learning by sharing, assisting, and supporting endeavours to learn (Chen, Hsu & Caropreso, 2006; Hrastinski, 2008; Resta, 2007; Resta et al., 2002). Students are expected to help each other and to share knowledge as well as resources. This includes different activities such as explaining how to solve problems and discussing concepts. This is important to ensure that collaborative learning environments support individuals and academic achievement.

Social skills means that the group members should have opportunity to practice decision-making, leadership, communication, and conflict-management skills (Jonassen et al., 1995; Resta et al., 2002). Students are required to practice these skills for interacting effectively with others and to become socially skilled. Hence,

students can help each other to accomplish group tasks and to keep positive social relationships in the group.

Group processing means that groups need to discuss how they meet their goals and how to remain effective in relationships amongst members (Bennet, 2004; Chen et al., 2006; Hrastinski, 2008; Resta et al., 2002). Group work is important for the group to evaluate efforts and improve work to meet the group's goals. So, student collaboration within social interaction will help students share information, construct knowledge and solve a problem while working on a task (Roberts, 2004).

Online and blended learning

Online and blended learning play an important role in supporting collaborative learning. This section discusses conceptual frameworks about online and blended learning as well as the advantages of online learning to students. Online learning is important in supporting student learning in educational settings. The traditional classroom environment focuses on teacher-centred strategies. In some cases, this can be modified to encourage student-centred learning activities in online learning environments such as problem-solving, learning exploring, and collaborative learning (Haefner, 2006; Jonassen, 2000; Lu & Chiou, 2010). The potential of online learning is not merely to have positive contributions to student learning, but also providing students with a range of freedom in the learning environment. Providing flexibility is a key element in developing learning.

Several research studies have shown the importance of online learning in terms of flexible learning to support student-centred approaches in the online learning environment (Herrington, Reeves & Oliver, 2005; Huang, 2002; Rovai, 2004; Yoder, 2007). Flexible learning means that students' education, including their learning styles, collaboration, task assessment, and time and place for learning are independent (Ling, Arger, Smallwood, Toomey, Kirkpatrick & Barnard, 2001; Willems, 2005). In this form of learning, students are provided with different

possibilities to learn according to their circumstances. They can determine what knowledge they need to gain, and what is valid and what is not. They also may consider what learning method they need to adopt, how they communicate, and how they meet their individual needs. This indicates that flexible learning is often related to student-centred instructional approaches (Collis & Moonen, 2001) and the control of learning is shifted from the teacher to the student (Hall, 2008). This flexibility has become meaningful when associated with online learning. Online flexible learning has been an essential part in Western higher education since the integration of online technologies have emerged in universities in the mid 1990s, and new learning outcomes have been required (Visser, 2008).

Use of online learning environments in teaching has become an expectation (Lee, 2008). It is thought that these types of online tools can prepare learners to actively participate in the learning environment, and has become an important requirement for education, especially in a networked information context where knowledge is an essential resource needed for social development. "At this point, education institutions are being forced to find better pedagogical methods to cope with the challenge, and they expect that computer will play an important role in restructuring teaching and learning processes to better prepare students" (Lee, 2008, p. 21).

Online learning provides students with more opportunities for effective learning as research has noted the educational and social advantages of the online learning environment (Ding, Niu & Han, 2010; Rourke, Anderson, Garrison & Archer, 2001). It provides students with the opportunity for thinking and responding in online discussions without the time pressure of an instant response that is required in class discussions. In addition, it provides students with the opportunity to revise previous comments and posts which allows for in-depth reflections on the issues (Brady, Holcomb & Smith, 2010).

Different research studies have highlighted the importance of online learning and its advantages for increased interaction and positive learning outcomes over traditional

classroom learning (Thurmond & Wambach, 2004; Carswell, Thomas, Petre, Price & Richards, 2000). Thurmond and Wambach (2004) studied students' interaction and their performance in an online course within an online learning environment and its impact on student outcomes, compared to classroom counterparts. This study is reviewed because it illustrates how online learning supports student learning and results in positive learning outcomes by providing students with more opportunities to interact with the teacher, content, context, and peers than traditional classroom learning. Thurmond and Wambach (2004) studied four types of interaction including student-content, student-student, student-teacher and student-interface. In student-content interactions, findings of the study showed that students were engaged in more constant interaction with more satisfaction in learning in the online course. However, some students preferred to learn the content in traditional classrooms. In student-student interaction, the study found that students interacted much more in the online learning environment and their performances were improved compared to their interaction and learning in the classroom. Thurmond and Wambach (2004) found that students interacted more with their teachers in the online course. The relationship between students and teachers was positive and they received timely and prompt feedback from their teacher in the online course. The findings of the study also indicated that the student-interface interaction was related to how students perceive the technology rather than the experience of computer use in learning. Therefore, difficulty with the use of computers in learning, or problems of interacting with technology, do not necessarily indicate negative student-interface interactions. The findings of this study inform us that students are more likely to interact with the teacher, content, and peers within an online course. This indicates that online learning environments can offer increased levels of interaction to support student learning, as compared to traditional classrooms (Al-Keaid, 2004).

Carswell et al. (2000) conducted a study for undergraduate students in an online learning setting. The study is reviewed because it illustrates how online learning environments can support student learning within an interactive environment. The study compared two groups of students in online learning and classroom

environments in computer science courses. The study was conducted to compare students' learning outcomes in both lecture and online learning environments. In the online environment, the course version that was being taught in face-to-face mode was replaced with online learning modules. There were 105 students in the lecture course. In the first semester, the online course version was taught to 180 students, and then 129 students in the following semester. The study found that the two groups of students had similar learning outcomes. However, increased interactions took place in the online learning group between peers and teachers. The findings suggest that online learning enhances higher-order learning outcomes. The findings of these studies show the power of online learning over conventional classroom learning on student learning, particularly for interaction. They emphasise that online learning has the ability to provide students with more opportunities to increase interaction and improve performance (Guzdial, 2003; Hoadley, 2002).

Furthermore, mediating tools and the use of technology have capabilities that can be used to enhance student learning through knowledge construction and student communication within the online learning environment (Chen et al., 2006; Driscoll, 2002; Foster & Smith, 2010; Johnson & Johnson, 2004; Reiser, 2001). Chen et al. (2006) conducted a study to investigate students' online social and learning behaviours and students' attitude toward interaction in the online learning environment. The study is reviewed because it demonstrates how student learning can be supported by knowledge construction and student communication within online interaction. The participants were students engaged in two instructional technology courses taught in two different sites. The first course was completely online and for ten students. The second course was a web-enhanced face-to-face classroom approach. The study found that online learning environments provided students with different opportunities to enhance their social interaction and communication. The study found that students increased their interactions between students and knowledge, between students and peers, and between students and teachers through the online learning environments.

Chen et al. (2006) argues that online learning allows students to learn and communicate in a flexible way through their online discussion. They found that online interactions promote students' thinking to build new ideas through their dialogues which can help them to interact with each other when they are in different places. These findings are supported by other research studies that have also found that student communication skills and their knowledge construction can be improved during online conversations (Greenfield, 2003; Hrastinski, 2008).

It is evident that online learning has advantages and can possibly have a strong impact on student learning. Therefore, the current study is conducted to examine how student learning can be supported by collaborative tools in a blended learning environment in Saudi Arabia. The following section examines teacher's practice and students' online learning in higher education.

Online learning in higher education

This section explores and discusses students' online learning in a higher education context, and how it can be fostered by the incorporation of online collaborative tools. The literature on online collaborative learning in a higher education context is also reviewed and examined. Nowadays, student-centred learning strategies such as collaborative learning, particularly in a higher education context, allows students to collaborate with the teacher and peers in order to build knowledge, share information, and solve problems (Beebe, Vonderwell & Boboc, 2010; Haefner, 2006; Lu & Chiou, 2010).

In the higher education context, online tools play an essential role in collaborative learning when learners work in groups to solve a problem or when required to work on a collaborative task in an online learning environment (Bennet, 2004; Johnson & Johnson, 2004). The characteristics of online collaborative learning are that students share information and discuss ideas for knowledge construction, compare and evaluate the knowledge that they have about the problem, explore the problem and

discover what needs to be known, communicate and negotiate each other's ideas, test the available solutions on the problem, and make a decision for an agreement or provide alternatives (Aviv, Erlich, Ravid & Geva, 2003; Boettcher & Conrad, 2010). To support student online collaborative learning in the higher education context, these students should be provided with a learning environment that enhances their engagement, participation, and responsibility for learning. According to Resta et al. (2002), social interaction, task management, leadership, and trust are the relevant elements for effective online collaborative groups.

Social interaction is related to interpersonal behaviours of group members that are needed for positive group interactions. These behaviours include acceptance, respect and readiness to work together. In the online learning environment, social process is needed among the group members to ensure that every member accepts responsibilities for each task verified by the group. In this context, it is each member's liability to assist to promote a group sense, and to respect diversity of backgrounds and opinions (Johnson & Johnson, 2004; Roberts, 2004). *Task management* involves group-functioning skills ordered by assistance, responsibilities and sharing in order to successfully achieve group tasks. In this environment, each group member has to be willing to initiate roles and actions on task accountabilities, and to share ideas and resources (Johnson & Johnson, 2004; Roberts, 2004). *Leadership* refers to team efforts of coordination, participation, and encouragement, and ensures all voices in the team are heard. This also indicates that group members are able to provide leadership and support for the group whenever necessary, and to negotiate and make compromises on task process (Roberts, 2004). *Trust* refers to interpersonal and communication skills that guide us on how to know and trust each other, and how to manage conflict in the group. In the online learning environment, it is each individual's responsibility in the group that every member can contribute to positive conversation in order to resolve group conflicts (Chen et al., 2006; Greenfield, 2003).

Resta et al. (2002) present the reasons for using these elements for establishing online collaborative groups:

- Collaborative learning is effectively processed on the understanding that learning is a social interaction that occurs in groups (Johnson & Johnson, 2004; Jonassen et al., 1995; Roberts, 2004; Ding et al., 2010);
- Positive rapport between group members is required for purposeful collaborative learning environments (Johnson & Johnson, 2004);
- Providing individuals and groups with appropriate opportunities to complete the learning tasks is needed (Johnson & Johnson, 2004);
- Collaborative learning is a process of numerous activities including communication, participation, encouragement and interaction, which is different to traditional learning (Beebe et al., 2010; Chen et al., 2006; Hrastinski, 2008);
- Learners are provided with the opportunity to learn how to evaluate their work in groups and provide proper feedback for their peers (Johnson & Johnson, 2004; Jonassen et al., 1995);
- Learners also are provided with the opportunity to learn how to improve their roles as group members in collaborative learning environments (Johnson & Johnson, 2004; Jonassen et al., 1995; Brady et al., 2010).

Thus, the key elements illustrated by Resta et al. (2002) for collaborative learning environments include: can support student engagement, participation and responsibility for learning; promotes student understanding; develops interpersonal learning skills of problem- solving and decision making; and fosters greater work (Bennet, 2004; Chen et al., 2006; Greenfield, 2003; Hrastinski, 2008; Uribe, Klein & Sullivan, 2003). Therefore, students are provided with opportunities to share knowledge, resources and skills to meet their reciprocal goals in online collaborative learning environments (Johnson & Johnson, 2004; Resta et al., 2002).

Uribe et al. (2003) conducted a study to investigate the importance of online collaborative learning amongst group members working on a task to solve a problem. The study is reviewed because it illustrates that collaborative learning through the use of online tools supports student learning in solving a problem. The participants were two cohorts of tertiary students who work collaboratively and individually on a task. The study found that students who participated in group work through online tools did considerably better than who performed individually. The findings of the study show that online collaborative group members had more opportunities to interact with each other on the task. The group members attempted to spend more time on developing the ideas to understand the problem, find a better solution, and achieve their mutual goal. This indicates that online collaborative learning in a higher education context can reinforce student learning in terms of enhancing communication, knowledge construction, and problem-solving that traditional classrooms do not offer.

Chou (2004) studied interaction forms among higher education students within online learning environments. The study is reviewed because it demonstrates that collaborative learning through the use of online tools provides students with opportunities for interaction which enhances student learning. Chou (2004) determined different types of interaction such as student-content, student-teacher and student-student as well as variables of student characteristics, students activities and online tools. Chou's (2004) study found that student achievement and knowledge sharing were promoted by collaboration in the social interaction environment among peers. Chou (2004) claimed that online tools support sharing knowledge and academic achievement among students through social interaction environments. These were the main aspects of collaborative learning among learners. So, online learning environments need to be flexible in time and location as well as challenging to support problem solving and knowledge building in a collaborative learning context (Resta, 2007).

Online technologies facilitate student interactivity, support synchronous and asynchronous communication, and facilitate social collaboration by engaging them in a problem on a task in their learning context (Jonassen, 1991; Jonassen, Cernusca & Ionas, 2007). According to Johnson, Johnson & Holubec (2002) collaborative learning environments can be created through the use of online collaborative tools such as email and online chats. These collaborative tools can "change the way students and instructors interact, enhance collaborative learning opportunities, facilitate class discussion, and more writing from solitary to more active, social learning" (Johnson et al., 2002, p. 7). Online collaborative tools can be classified into two types: synchronous online tools and asynchronous online tools. Synchronous online tools include text-messages chat, video or voice-conferences or any other tools that allow students to collaborate and interact with the teacher or other students in real-time when they are in different places. On the other hand, asynchronous online tools include email, discussion forum, blogs, wikis, or any other tools that allow students to collaborate and interact with the teacher and other students at different times and places (Chen et al., 2006).

In the higher education context, there are two types of online learning to support student collaboration based on the categories of online collaborative tools. These are synchronous online learning and asynchronous online learning. Hrastinski (2008) provides a discussion on the difference between synchronous and asynchronous online learning and the advantages of each type. Hrastinski (2008) claims that the key advantages of synchronous online learning is that students are more motivated in the learning environment because of a quick response from both the teacher and peers at the same time of learning (Swenson & Redmond, 2009). In this learning environment, students and the teacher are "more social and avoid frustration by asking and answering questions in real time" (Hrastinski, 2008, p. 52). Alternatively, an important advantages of asynchronous online learning is flexibility where students are able to post messages, review other's work and interact with the teacher and peers at any time. Within this learning environment, students are provided with more opportunities to organise their thoughts, read, and send responses. This mode of

flexibility reinforces student reflection and improves student ability to construct knowledge (Hrastinski, 2008; Rubin, 2002; Tsai, Lin & Yuan, 2002; Wen & Tsai, 2006). The use of synchronous and asynchronous online tools in the higher education context is discussed below.

Both synchronous and asynchronous online tools such as chat, email, and discussion forums can be used for student collaboration in a higher education context (Herrington et al., 2005; McKnight, 2004; Simonson et al., 2009). Online collaborative tools can facilitate communication between students and the teacher and also among students. Teachers may post their lessons into a discussion forum on a particular Webpage via their computers and let students read them via their own computers. In this way, students can discuss their assignments or tasks with peers via a particular discussion forum or chat room. Students can be provided with interesting materials, which results in interaction and flexibility with online learning environments (Herrington et al., 2005; Safran, Helic & Guetl, 2007; Simonson, Smaldino, Albright & Zvacek, 2009).

Studies have shown that online collaborative tools were used by the students to support their group task (Gunawardena, Nolla, Wilson, Lopez-Islas, Ramirez-Angel & Megchun-Alpizar, 2001; McLaughlin, 2002). These studies are reviewed as they demonstrate how tertiary students in Western countries use online collaborative tools to support learning in order to complete their tasks. The study conducted by Gunawardena et al. (2001) found that US students tended to use asynchronous tools, especially the discussion forum, to complete their group task because of its flexibility. The findings of the study revealed that the group members could read and reflect on responses as well as write their contributions at any time. McLaughlin (2002) also found that Australian students actively participated in the discussion forum to support their group work and to complete the task in the online learning environment. In summary, this review shows that many researchers express the importance of online learning to support student collaboration in Western higher education as well as the ability of online collaborative tools to support student

learning. However, limited research of online potential, particularly online collaborative tools has been conducted in the Saudi context. Therefore, one of the aims of this study is to investigate student collaboration using collaborative tools to support their learning in a blended learning environment in a Saudi higher education context.

The evolution of technology and communication has transformed the possibilities for learning as input is transferred to learners. Students are provided with different ways of communication with teachers and peers in the learning environment as technology is rapidly developed and has numerous forms to facilitate learning. However, cultural differences and expectations within these possibilities can cause psychological gaps and barriers that prevent this evolution (Lee, Driscoll & Nelson, 2004). Moreover, misunderstanding and miscommunication may be more apparent among members of certain groups as a result of cultural differences (Chase, Macfadyen, Reeder & Roche, 2004). The level of learners' contribution in social interaction environments is also influenced by their culture (Bruner, 1991; Chase et al., 2004; Lee et al., 2004).

Nature of culture

In order to apply collaborative online learning in higher education in Saudi Arabia, it is important to understand that culture plays a crucial role in deciding on what is appropriate in a specific context. It is important to consider the nature of culture given the locus of the research. The role of the teacher is to create a social and culturally appropriate environment that permits interaction either between students and among students and their teacher (Carr-Chellman, 2000). However, such understanding may clash with cultural groups that promote and support learning styles that encourage conventional instruction (Hofstede, 2001). The following section begins to describe cultural differences informed by Hofstede's (1980, 2001) dimensions of culture and Hall's (1966, 1976) theory of contextualisation, and subsequent implications for learning.

With the increased use of the Internet in higher educational settings to deliver courses, students may provide some challenges to the teaching design and the learning environment related to cultural backgrounds (Macrine, 2010; Mason, 2007). Therefore, it is imperative that we understand cultural perceptions and how culture impacts the process of collaboration and communication, especially in online learning. This will assist to shape student learning and examine students' responses on their learning from a particular cultural background.

The notion of culture is difficult to define because it is a complex concept. It can be defined as culmination of faith, tradition, ethic, art, knowledge, law and other aptitudes gained by individuals as a member of society through their interactions (Tylor, 1871). Matsumoto (1996) further describes culture as "the set of attitudes, values, beliefs, and behaviours shared by a group of people" (p. 16). Hofstede (2001) notes that individuals can articulate their understandings based on the diverse values, beliefs, behaviours and attitudes they have in their individual country. He defines culture as "the collective programming of the mind that distinguishes the members of one group or category of people from another" (Hofstede, 2001, p. 9).

Matsumoto (1996) and Hofstede's (2001) dimensions of culture provides a framework through which psychological, individual, and social constructs fundamental to collaboration in a blended learning environment can be investigated. Combining Hofstede's dimensions of culture with Hall's (1966, 1976) theory of contextual cultures provides a connection between culture and communication. The combination of these frameworks can help to explain the influence of culture on student learning in terms of collaborative learning environments, and the acceptance and use of online learning tools.

Hofstede's dimensions of culture

Hofstede (1980), an IBM psychologist who studied the differences in human thinking and social action (with 116,000 participants from 72 countries), found that

individuals hold mental programs which include an essential part of national culture, which is most obviously articulated as diverse values that dominate citizens from various countries (Hofstede, 2001). Further, these mental programs are enhanced through interactions with family and schools as well as organisations. He describes the influence of culture on the individual values among people living in a society. He also explains how these values are related to individual behaviours in several fields, especially for cultural psychology and cultural communication. Hofstede's (1980) research identified five main dimensions of culture that demonstrate value systems, and that influence thinking patterns, feeling, social action, and institutions. To demonstrate cultural differences in social life and in learning environments among individuals in different countries with a focus on Arabic countries, each of these five dimensions are discussed:

Dimension 1: Individualism vs. Collectivism

According to Hofstede (1980, 2001), Individualism vs. Collectivism (IC) is the extent to which people are expected to look after themselves or be integrated into groups. Individualistic countries include the United States, Australia, New Zealand, Canada, Great Britain, and the Netherlands. People from these cultures place their main concern on an individual's needs and achievements. In contrast, Collectivist countries included Pakistan, Columbia, Japan, Costa Rica, China, Peru, Indonesia, Singapore and Arab countries. People from these cultures often prefer group interests and enhance group achievement. The family's instruction and history play a fundamental role to determine how people see an individual with less emphasis on individual expression and satisfaction of personal needs. Hooker (2003), noted that individuals from Collectivist societies are "integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty" (p. 136). Cultural differences in (IC) dimensions in the learning environment are summarised in Table 2.1

Table 2.1 IC differences in the learning environment.

Collectivism	Individualism
Students prefer to work within group	Students prefer to work individually
Aim of learning is how to do	Aim of learning is how to learn
One way communication (students do not speak up in class)	Two way communications (expected between teacher and students)

In the learning environment, learners in Individualistic cultures prefer to learn and work on their own, and are more likely to be independent (Bauer, Chin & Chang, 2000; Hofstede, 1980, 2001). However, learners in Collectivist cultures often prefer to learn and work as a group, and the purpose of their learning is to produce or maintain social status (Bauer et al., 2000; Hofstede, 1980, 2001). Students from Collectivist cultures emphasise harmony in groups that leads to shared resources as they consider that all members have similar values, beliefs, actions, and attitudes. On the other hand, students from Individualistic cultures share resources with their own family only and rely on personal attainment and independence as they are responsible for their own achievement and failure (Hui & Triandis, 1995). Learners from Individualistic cultures emphasise personal goals. In contrast, learners from Collectivist cultures emphasise group goals. "Individual self-concept is more essential than group affiliation, personal goals are more important than group goals, and individual welfare is placed above the welfare of the group. Thus, the social world is less crucial to an individual's sense of well-being, resulting in a smaller in-group" (Alfred, Chia, Wuensch & Ren, 2007, p. 2).

Dimension 2: Power Distance

Power distance (PD) is defined as "the extent to which the less powerful members of organisations and institutions accept and expect that power is distributed unequally" (Hofstede, 2001, p.83). He refers to this principle as status differentiation and "the degree to which cultures maintain status differences among their members" (Hofstede, 2001, p.84). Gudykunst (2003) argues that individuals from Collectivist cultures with more power distance consider:

power as a basic fact in society, and they stress coercive or referent power. Members of low power distance cultures, in contrast, believe power should be used only when it is legitimate and prefer expert or legitimate power (p. 20).

From Hofstede's research (1980, 2001), Collectivist countries with more power distance were Mexico, Malaysia, Philippines, Panama, Venezuela and Arab countries. In contrast, Individualistic countries with less power distance were New Zealand, Finland, Norway, Denmark, Sweden and Austria. Cultural differences in PD dimension in the learning environment are summarised in Table 2.2

Table 2.2 PD differences in the learning environment.

Low Power Distance	High Power Distance
Student-centred learning	Teacher-centred learning
Students anticipate to demonstrate initiative	Students anticipate to be informed what to do
Teacher's role as facilitator	Teacher's role as didactic

In the learning environment, more powerful learners in Collectivist cultures rely on their teacher for their learning, as the teacher is the sole authority who transfers knowledge to students within the learning environment. They believe that their teachers are experts in their teaching specialisations (Hofstede & Hofstede, 2005; Ku & Lohr, 2003; Westbrook, 2006). It is considered culturally anomalous that teachers are being questioned by students in their classrooms, or challenged by opposing viewpoints on a discussion. Therefore, students from these cultures fear disrespecting their teachers, and they often remain on listening and learn by receiving information by the teacher through lectures (Bodain & Robert, 2003; Ku & Lohr, 2003; Reisetter & Boris, 2004). Alternatively, less powerful members in individualist countries prefer an autonomous environment for living and learning. Less powerful students in Individualistic cultures demonstrate initiative as they develop and take control of their knowledge. The role of the teacher is a facilitator in the learning environment (Bauer et al., 2000; Hofstede, 1980, 2001).

Dimension 3: Uncertainty Avoidance

Uncertainty avoidance (UA) refers to the extent to which members in a society prefer structured over unstructured situations, or the degree of a society's tolerance for ambiguity (Gudykunst, 2003; Hofstede, 2001; Moore & Anderson, 2003). Individualistic countries with less UA included Singapore, Denmark, Great Britain, Sweden, and Hong Kong. In these cultures, people have more tolerance for uncertainty. They might explore unpredictable or uncontrollable situations. They accept change and disagreement. Therefore, they are flexible and innovation is encouraged. In contrast, Collectivist countries with more UA were listed as Greece, Uruguay, Salvador, Belgium and Arab countries, people were found to prefer regulations and rules and they tend to carefully organise to reduce the degree of uncertainty. Thus, they are less likely to accept individuals with unusual ideas and grasp a strong need for consensus. Cultural differences in UA dimension in the learning environment are summarised in Table 2.3

Table 2.3 UA differences in the learning environment.

Low Uncertainty Avoidance	High Uncertainty Avoidance
Teacher is sociable and amenable	Teacher is the expert and has all the answers
Students prefer open-ended learning environments	Students prefer structured learning environments
Students prefer ambiguous goals with broad assignments	Students prefer precise goals with detailed assignments

Learners with more UA in Collectivist cultures prefer structured learning situations with precise goals and detailed assignments. Students consider the teacher as the expert who holds the knowledge and has all the answers (Bauer et al., 2000; Hofstede, 1980, 2001). In individualistic cultures with less UA, students prefer open-ended learning environments with ambiguous goals and broad assignments. Students expect the teacher to be more sociable and amenable in the learning situation (Bauer et al., 2000; Hofstede, 1980, 2001; Lim, 2003).

In Collectivist societies, learners are more stressed when involved in technology-related ambiguities because they have more uncertainty avoidance and fear alteration (Tham & Werner, 2002; Hofstede & Hofstede, 2005). This means that students feel threatened when engaged in uncertain learning situations such as online learning (Hofstede & Hofstede, 2005). However, students from Individualistic cultures have less uncertainty avoidance and welcome change. So, online learning is more appropriate for these students (Lim, 2003). In addition, students from Collectivist cultures need more rules of instruction and formal order to control their interaction and social behaviours. In contrast, students from Individualistic cultures require few rules of instruction to monitor their social actions (Hofstede & Hofstede, 2005; Lim, 2003). Therefore, students' cultural factors that support or inhibit their learning in the online collaborative learning environment are explored in this study.

Dimension 4: Masculinity vs. Femininity

Masculinity vs. Femininity (MF) refers to the degree to which gender is distributed in emotional and social roles within the culture. Masculine countries such as Arab countries, Japan, Venezuela, Italy, Austria and Mexico support male-based roles. In these cultures, the means of competition and challenge are promoted, and personal decision making is considered. However, the feminine cultures such as Sweden, Denmark, Norway, Yugoslavia and Finland promote emotions, sympathy, encouragement, quality of life, and the negotiation for decision making is emphasised. Cultural differences in MF dimension in the learning environment are summarised in Table 2.4

Table 2.4 MF differences in the learning environment.

Femininity	Masculinity
Teacher's friendliness and social skills are very important	Teacher's qualification and academic reputation are very important
Student's social adaptation is appreciated	Student's performance and achievement are appreciated

In masculine cultures, teacher's academic reputation and qualifications as well as students' achievement are the dominant factors in the learning environment (Bauer et al., 2000; Hofstede, 1980, 2001). However, in feminine cultures, students are more likely to be average and less enthusiastic in the learning environment (Bauer et al., 2000; Hofstede, 1980, 2001).

Dimension 5: Long vs. Short-Term Orientation

This dimension "refers to the extent to which a culture programs its members to accept delayed gratification of their material, social, and emotional needs" (Hofstede, 2001, p.351). This is related to a culture's concern for the future as well as values that will not essentially provide immediate benefits, but it should be done with respect for tradition as well as fulfilment of social commitments. Hofstede (2001) explains this as:

Long Term Orientation stands for the fostering of virtues oriented towards future rewards, in particular perseverance and thrift. Its opposite pole, Short Term Orientation, stands for the fostering of virtues related to the past and present, in particular, respect for tradition, preservation of 'face' and fulfilling social obligations (Hofstede, 2001, p.359).

Cultural differences in Long/Short-Term Orientation in social norms (Table 2.5)

Table 2.5 Long/ Short-Term Orientation social norm.

Long-Term Orientation	Short-Term Orientation
Delayed fulfilment of needs is accepted	Immediate fulfilment of needs is accepted
Traditions are adaptable for changed situations	Traditions are revered
Family life is directed by shared tasks	Family life is directed by instructions
Frugality and perseverance are taught as virtues	Social consumption is taught as virtue

In summary, students from Collectivist cultures tend to learn and work as a group to maintain social status. They rely on their teachers as they believe that teachers are experts for learning. They resist change, particularly in the online learning environment, because they have more uncertainty avoidance. In these cultures, people revere traditions and social norms are considered. In contrast, Individualistic cultures are more likely to be independent, and the role of the teacher is a facilitator in the learning environment. Online learning is better suited for them because they accept change and have less uncertainty avoidance. In these cultures, traditions are adaptable and perseverance is considered.

High vs. low-context communication

The theory of intercultural communication developed by Hall (1966, 1976) provides a connection between culture and communication. In this theory, communication forms have been characterised on direct and indirect information. Hall's (1966, 1976) theory of high-context culture (HC) and low-context culture (LC) explains how a culture reflects society's dependence on communication to deliver the meaning of a message. A key element of this framework is context. The theory is employed in this study to explore contextual factors that support or inhibit students' learning in the blended learning course. In online learning, there is significant dependence on written communication and a lack of verbal forms; online collaborative learning environments are low-context. Differences in the learning environment in high-and low-contextual cultures based on Hall's (1966, 1976) theory are summarised in Table 2.6 (over page).

Table 2.6 Differences in communication in the learning environment in high- and low-contextual cultures.

Low-contextual Learning	High-contextual Learning
Emphasis on learning outcomes (student-centred learning)	Emphasis on teaching input (teacher-centred learning)
Emphasis on development of student's personal skills	Emphasis on content and knowledge transferred by the teacher (little emphasis on student's personal skills)
Assessment used as a feedback instrument	Assessment is main focus of learning
Teacher as a facilitator in the learning environment	Students performance reliant on teacher knowledge
Relationship between teacher and student is informal	Relationship between teacher and student is formal (a sign of respect)

The cultures of Japan, China, Korea and also Arab countries are identified as high-contextual cultures. In these cultures, "most of the information is either in the physical context or initialised in the person, while very little is in the coded, explicit, transmitted part of the message" (Hall, 1976, p.79). There appears no obvious rule for communication in this context, and the audience is supposed to recognise and understand implicit communication (Hall, 2000). They depend on a vague meaning of the messages, compared to people from low context cultures who primarily depend on clear statements to transfer the messages (Hall, 1976). Wurtz (2005), states that people in "high context communication will jump back and forth and leave out detail, assuming this to be implicit between the two interlocutors" (p. 2). Thus, people in these cultures attempt to be indirect, utilise ambiguous language to communicate, and constantly use mute communication to attain their reciprocal perception (Hall, 1976; Wurtz, 2005).

In the learning environment, Hall's framework (1976) reveals that teacher instruction and knowledge transferred by the teacher are emphasised in high-contextual cultures. However, there is less emphasis on students' personal skills and assessment is the main focus. The rapport between teachers and students is formal as sign of respect. Sheu (2005) studied international students' perceptions towards online learning in American higher education. The participants were students from Western countries,

Middle Eastern and Asian countries. Students' communication in expressing their views and their perceptions in regard with online learning were compared. Sheu (2005), found that learners in high context cultures such as Middle Eastern and Asian countries take action slowly when confronted with a hard circumstances. They react gradually in expressing their opinions, compared to learners in low context cultures such as Western students. Therefore, collectivist cultures utilise high context communication whereas individualist cultures utilise low context communication.

Alternatively, most of northern Europe, Germany and the United States are considered to be low-contextual cultures. These cultures rely on "the mass of information is vested in the explicit code" (Hall, 1976, p. 70). In these cultures, communication is obvious and tends to prevent silence because people in these cultures believe that silence sends message of uncertainty. "In conversation, people in low context cultures will shift from information already stated to information about to be given" (Wurtz, 2005, p. 2). Hence, communication is direct and open depending on the content. Members of these cultures tend to place personal goals, prefer to make autonomous decisions and pursue individual achievements with personal time. They also like to be challenged (Hall, 1976; Wurtz, 2005). Based on Hall's framework (1976), in the learning environment, learning outcomes and development of students' personal skills are emphasised. There is less focus on teacher instruction and rapport between teacher and students is informal.

In Saudi Arabia, students tend to greatly rely on the support from their families and social groups (Al-Keaid, 2004; Osilan, 2009). They are taught to be passive learners, and often acclimatise to memorising the subject content through rote learning directly from the teacher in a traditional face-to-face classroom (Al-Keaid, 2004). As students from Collectivist culture, they experience one way communication with high emphasis on teaching input in the learning environment (Hofstede, 1980, 2001; Hall, 1966, 1976). Therefore, this study aims to examine contextual and cultural factors that support or inhibit student learning within online collaborative learning environments.

Research employing Hofstede's (1980, 2001) and Hall's (1966, 1976) frameworks have explored cultural factors influencing student learning in the online learning environment (for example, Al-Harthi, 2005; Keng, 2010; Xiong, 2009). A research study was conducted by Xiong (2009) to examine Chinese students' collaborative online behaviours when solving an ill-structured problem. Xiong's study (2009) is discussed because it is similar to the context of Saudi Arabia, the context of the current study. They both are collectivist cultures with more power distance and more uncertainty avoidance as classified by Hofstede's (1980, 2001). They are also both high context cultures as determined by Hall (1966, 1976). The review of this literature will help understand how the cultural factors impacts student learning and collaboration in the online learning environment.

Hofstede's (1980, 2001) dimensions of culture and Hall's (1966, 1976) contextual communication theory were used in Xiong's study (2009) to investigate cultural values and beliefs that impact students' collaborative online learning experiences. The participants were Chinese students enrolled in business programs at US universities. The findings of the study indicated that Chinese students tended to engage in online collaborative learning environments. These students participated as collaborative students as they organised ideas, negotiated and shared knowledge, monitored group work, and provided feedback. The findings also show that Chinese students' behaviours were impacted by their culture in the online learning environment through their communication, conflict management, leaders and relations, and relationship building.

The findings of Xiong's study (2009) show that Chinese students reflected a Collectivist culture in their online interactions. The study found that Chinese participants were more collectivist-oriented through their online group work, as the students collaborated with each other in the online collaborative learning environment in order to organise thoughts, shared knowledge, and provided feedback on group process. The findings showed that Chinese students helped their group leaders to assume the role of being teachers, when the teacher could not be reached

in the online learning environment, as the Chinese culture displays a high level of power distance. The study also found that Chinese participants had a great preference for structured learning during their online learning which corresponded with Hofstede's (2001) study in regard to uncertainty avoidance. They were inclined to occasionally review their group process and what they learnt to make sure that they were on track.

The findings of the study also suggested that Chinese culture is feminine. Xiong's study (2009) found that Chinese students were followers or supporters during the online collaborative learning as they believe that the average learner is the norm. The study also found that Chinese students tended to use silence and rely on indirect communication to deliver the meaning of their messages, which reflects a high-context culture. This could be similar to the Saudi Arabian context as Hofstede (2001) states that Arab students prefer to learn and work as a group instead of individually. They rely on their teachers for their learning. They also prefer structured learning environments with detailed tasks, and they believe that teachers are experts in their teaching. In addition, Arab learners are classified by Hall (1966, 1976) as people from high-context culture where individuals use in-direct communication to deliver their meaning of a message. Thus, this study aims to examine student collaboration, and explore contextual and cultural factors that support or hinder student learning in a blended learning environment in Saudi Arabia.

A similar study conducted by Keng (2010) shows Malaysia as a Collectivist country with more power distance than US as an Individualistic country. Keng's work (2010) compared the effectiveness of an online learning system for American and Malaysian students in terms of four pillars (technology/support, course, professor, and student) based on Hofstede's cultural dimensions. The participants were students enrolled in online courses in two American universities and one Malaysian university. The participants were surveyed to examine their levels of satisfaction and the levels of importance they ascribed towards the four pillars. Different cultural dimensions were

also surveyed and demographic information was collected from the students. The results of the study indicated that American learners registered a relatively higher degree of online learning system effectiveness in the course and professor pillars than Malaysian students. The findings of the study also showed that Malaysian teachers who used the online learning system tended to develop a teaching method more appropriate for the cultural norms of Malaysian society. This indicates that Malaysian students are more powerful in their collectivist culture and their teachers are responsible to promote their teaching based on the cultural aspects. However, Keng's study (2010) has not determined how the students' interaction took place through the use of online learning and how these interactions were influenced by their culture.

In summary, this section has outlined Hofstede's culture dimensions and Hall's concept of low and high context communication as theoretical frameworks that were used for this study. This section has also identified the need to understand how cultural differences may affect student learning and engagement with different learning environments. Despite the availability of literature on the interaction between cultural differences and online learning environments, there are few studies conducted that propose design principles for blended learning environments for an Arabic context. Therefore, one of the aims of this study is to explore contextual and cultural factors that support or inhibit student learning in a blended learning course in Saudi Arabia. The following sections describe teaching and learning in higher education in Saudi Arabia.

Higher Education in Saudi Arabia

This section provides a discussion around teaching and learning in Saudi higher education. The literature on the use of online learning and the issues of collaborative learning in Saudi higher education context are reviewed and examined. It also provides a discussion of how cultural differences may affect student learning in an online learning context.

Higher education is managed by The Ministry of Higher Education. The Ministry's responsibilities are:

- To control the policy of higher education, universities and private colleges;
- To organise post-secondary programs;
- To manage scholarships of students studying abroad.

The policy of higher education in Saudi Arabia is "to ensure that education becomes more efficient, to meet the religious, economic and social needs of the country, and to eradicate illiteracy among Saudi adults" (Alabdulkareem, 2004, p. 36).

Technology and online learning

Use of technology in Saudi universities is still at the early stages (Al-Fulih, 2002; Allehaibi, 2001). Internet technology is in the process of being integrated into the curriculum in Saudi universities and colleges (Al-Wehaibi et al., 2008). However, there are some barriers that may explain the limited adoption of technology and its constraints in a higher education context in Saudi Arabia. These barriers could refer to the lack of Internet access, equipment and infrastructure, technical support, technology skills and computer literacy, financial support for online learning and teacher training for online instruction (Alaugab, 2007).

Technology became a part of the Saudi higher education context with the establishment of the Arab Open University in 2003 (Alanzzy, 2011). The Arab Open University provides Saudi students with the opportunity to be engaged with an online interaction environment that allows students to discuss their courses. Also, the National Centre for E-learning and Distance Learning (NCEL) also established by the Ministry of Higher Education in 2007, has the primary aims to provide technologies and the required training for online education, and to encourage institutions including universities to implement online courses. As a result, fourteen universities have subscribed to NCEL to obtain its services (NCEL, 2010). Although

the implementation of online education has grown since 2007, the transition to online learning is slow and tenuous in Saudi Arabia (Alanazy, 2011). "There are serious attempts to provide Internet access to most Arabic universities" (Al-Furaih, 2002, p. 29). For example, all faculty members of five Saudi universities have been provided with Internet access (Al-Habis, 2000). However, the Internet access available to Saudi universities is still limited (Allehaibi, 2001). The national statistics in Saudi Arabia show that young citizens are most of the Internet users, "and 77 percent of their Internet activities are communication activities such as sending and receiving e-mails and participating in forums and chat rooms" (Alanazy, 2011, p. 42). These statistics also indicate that only 5 percent of Internet activities are for educational purposes (Communications and Information Technology Commission, 2008). Despite the use of online learning being restricted in Saudi universities, it has gradually become an important part of the higher education context.

Teaching in Saudi Higher Education

This section discusses teaching methods that are often used in the Saudi higher education context. According to Al-Keaid (2004), directed teaching, lectures, and lectures with discussions are the teaching approaches that are most frequently used by teachers in Saudi universities. Teachers who mostly use these teaching approaches tend to communicate content and knowledge using lectures, and they spend little time on interactive teaching methods such as collaborative learning (Eggen & Kauchak, 2001).

Directed teaching

One of the common teaching approaches used in traditional face-to-face classrooms of Saudi universities is directed teaching. It can be defined as a practice where the instructor describes a new skill or idea to students who have opportunities to assess their understanding by participating in the learning environment under the

instructor's control (Eggen & Kauchak, 2001). Although a directed teaching approach is considered a teacher-centred method, where the teacher selects, structures, explains the concepts, asks students, and provides feedback, it can be a student-centred method if the students practically examine and respond to the teacher's questions (Eggen & Kauchak, 2001). Therefore, the teacher's feedback should be constructive, enhance students' thinking, and provide opportunity for future learning.

Teachers in Arab countries believe in delivering information which is the most popular method of teaching in higher education. Those teachers believe in teacher-centred approaches; that knowledge is contained either in their own thoughts or in the textbooks (Pratt, 2002). The conception of delivering information can be explained as the teacher who transmits information or knowledge to learners' memories through lectures and this information can be accessed via testing instruments (Hannafin & Hill, 2002). In this situation, students often sit in front of the teacher in rows listening to the lecture. Teachers who believe in this practice do not consider the learners' needs as they (learners) are only responsible for transmitting information in the learning environment. Thus, the teachers are responsible for providing proper knowledge to the learners and this knowledge should be kept in students' minds or in their notes (Hofstede, 1980, 2001; Hall, 1966, 1976).

Moreover, those teachers believe that knowledge must be delivered to the learners in the correct way, as they think of the learners as empty vessels that need to be filled (Kember & Kwan, 2000). The teachers also believe that all learners should receive the same information and they should be taught in the class as a whole group without taking into consideration student differences (Kember & Kwan, 2000). In Saudi Arabia, many teachers in universities prefer to use directed teaching as a teaching practice in their classrooms. Al-Keaid (2004), conducted a study among Saudi professors in two universities to examine their use of several teaching practices, and to investigate the factors that influence their choice of practice. The study found that

60 percent of participants stated that directed teaching was an excellent strategy and it was often used in their classrooms with their undergraduate students. The study also found that the most important factors influencing a professor's choice was their knowledge of directed teaching as well as their experience in teaching. Therefore, collaborative learning or a group work strategy is not often used in a Saudi higher education context.

Lecture with discussion mode

Another frequent teaching practice used in the Saudi higher education context is a lecture with discussion. In this method of teaching, the learning environment is monitored by the teacher. However, learners have opportunities to participate in the learning context. In this method, the teacher delivers information to students in the learning context and attempts to invite students' attention by raising questions and/or requesting students' inquiries or comments (Eggen & Kauchak, 2001). This method of teaching has advantages as well as disadvantages in the learning contexts:

Two advantages of this method are: (a) that feedback enables the instructor to determine how well the students understand the material, based on the kinds of questions and comments offered, and (b) that students have the opportunity to clarify confusing points in a timely manner. One limitation, however, is that one only gets this information from those students who actively participate; if a student does not understand or has a question but does not speak up, the teacher has no way of gauging that individual's comprehension during the class period (Al-Keaid, 2004, p. 46).

In Saudi Arabia, teachers in universities rely on the lecture method and the combination of the lecture and discussion method in their teaching. Almushaiqih (1993) studied a sample of 94 undergraduate education students who studied a course in Instructional Aid and Communication in Saudi Arabia. Those students were asked about the teaching approaches that they engaged in during the course. The study found that around 75 percent of the students affirmed that the lecturing method was most frequently used in the class. Al-Keaid (2004) examined Saudi professors with regard to their use of several teaching strategies in universities, and explored the

factors that influence their choice of strategy. The study found that 84 percent of Saudi professors reported that the lecture with discussion strategy was the most frequently used in their classrooms. The study found that one reason for using this method could be the lack of teacher training and pedagogical development. Another reason could also be the lack of effective evaluation for teaching in Saudi universities (Aldawood, 1999). Therefore, it seems that teachers in the Saudi higher education context rely on the teaching mode that delivers information to passive learners with less emphasis on collaborative learning or interactive group work.

Learning with technology

As discussed in the previous sections, teachers tend to use traditional teaching methods to deliver information with limited implementation of online instruction and collaborative learning. Studies of online education in Saudi Arabia have focused on faculty member attitudes to online instruction (Alaugab, 2007; Alghonaim, 2005; Alshehri, 2005). However, little research has focused on student attitudes to online learning (Alarfaj, 2001; Alaugab, 2007). Alaugab (2007) conducted a study to investigate faculty members' and students' attitudes with regard to using online education focusing on the advantages of using online education and the most significant obstacles that interfere with the effective use of online education. 130 teachers and 500 students across two tertiary settings participated in the study. The study found that there was no important correlation between student attitude and the variables of age, major, and academic level. However, home Internet access and student access to a home computer were considerably related to student attitudes toward online education. The study affirmed that both faculty members and students held positive attitudes to online education.

Alarfaj (2001) explored the perceptions of students at another tertiary setting. The study investigated the differences among participant perceptions based on gender, major and computer experience. Most students stated that an online course is appropriate, effective, and convenient. They also stated that an online course

provides them with more opportunities for learning, as they can gain information from several websites. On the other hand, they believed that online course may cause isolation and involves a number of technical problems. The findings of Alarfaj's (2001) study show that students were engaged in different online situations to communicate with their teachers. So, they believed that some social barriers were overcome to have better opportunities for learning as higher education students. The study found that students positively perceived online courses, particularly when using computers and accessing the Internet from home. These studies have not examined students' interaction during their use of online learning and how student learning was impacted by their culture.

In summary, most of the research to date has focused on attitude and perception with regard to online education in Saudi Arabia, and has found positive results in terms of the implementation of online education (Alaugab, 2007; Alghonaim, 2005; Alshehri, 2005; Alarfaj, 2001). The literature review reveals that there is limited research in online collaborative learning environments in Saudi higher education. Few of the studies focused on online learning have examined particular strategies of online learning such as collaboration.

Collaboration in Saudi higher education

The use of collaboration as a learning strategy is rarely used in Saudi higher education. This phenomenon reflects the nature of Saudi culture, where the relationship between teachers and students is a formal relationship (Al-Keaid, 2004). Typically, the teacher or professor sits or stands in front of the students in the classroom and presents the information from notes or uses the white board to emphasise key words. Students sit in front of the teacher and listen to the lecture and may take some notes (Al-Keaid, 2004). This is a common approach to teaching and learning in the Saudi higher education context.

The classroom of Saudi universities, primary, intermediate and secondary (high) school is one where the lecturer or the teacher is seen to have the right to control the teaching as well as the learning process. This reflects the Collectivist culture in that students rely on teachers for their learning (Hofstede, 1980, 2001), with little emphasis on student's personal skills (Hall, 1966, 1976). This traditional classroom reflects the culture of Saudi Arabia where the members of the family follow the leader of the family (parents) regardless of their gender or age. Students face a similar situation in the classroom with the teacher as the leader who rarely shares authority.

Cultural differences in online learning

This section discusses how the different cultural dimensions affects student learning in an online learning environment. Al-Harthi (2005) studied six Arab students from Arab Gulf States which include Saudi Arabia, Qatar, Bahrain, Kuwait, Oman, and the United Arab Emirates. The student participants were (three from Oman, two from Saudi Arabia and one from the United Arab Emirates) enrolled in an American-based online courses for distance learning. The student participants had similar cultures and languages (Arabic), religion, history, values and norms. They also even share similar political structures and socio-economic backgrounds. The study was conducted to explore students' experiences in online courses and how these experiences relate to the students' cultures.

Al-Harthi's (2005) study found that an Arabic cultural background influenced students' understanding and behaviours in online learning environments. Most of participants stated that learning was difficult and anonymous (Hofstede, 2001; Lim, 2003). Those participants referred the sense of anonymity to the lack of physical contact with the teacher and other students. Al- Harthi (2005) found that Arab students were less likely to participate in the course activities and less likely to initiate communications. The study revealed that Arab students expected teachers to initiate all communications, as they prefer to engage in one way communication

(Hofstede, 1980, 2001; Hall, 1966, 1976). It is crucial to examine how people in a culture may be supported by an online learning context and how particular aspects of culture may affect their participation (Chen, Mashadi & Harkrider, 1999; Gunawardena, Nolla & Wilson, 2003; Lim, Hung, Wong & Chun, 2004; Macrine, 2010). There is also research that examines the impact of a learners' culture on their ability to participate in an online learning environment (Robinson, 1999; Saba & Shearer, 1994; Tu & Corry, 2003; Wenger, 1998). Indeed, a culturally diverse online learning environment needs to create a learning context that respects and responds to cultural differences and sensitivities (Nieto & Bode, 2012; McLoughlin, 2001). It also needs student engagement that is respectful of the cultural context.

Summary

In this chapter, the literature shows the important roles of collaborative learning and online learning to enhance student learning. This review of literature demonstrates how online learning supports tertiary students' learning within group work. The discussion of cultural differences based on Hofstede's dimensions of culture and Hall's theory of intercultural communication illustrates the cultural factors that affect student learning, particularly in an online learning context. The literature review also revealed that most studies thus far have focused on attitude and perception within online learning environments in Saudi higher education. The use of online learning environments in Saudi Arabian higher education has not been addressed. Thus, this study investigates Saudi students using an online learning environment, and examines contextual and cultural factors that may support or inhibit collaboration and learning.

Chapter 3

Methodology

Introduction

This chapter reviews the methodology used to investigate student online collaboration in two semesters of study in a Saudi higher education facility. This study aims to examine how online collaborative tools may support student learning through group tasks which are orchestrated and completed within an online learning environment. Throughout the two iterations of this study, particular attention is paid to contextual and cultural factors that could potentially support or hinder student learning in the blended learning environment.

This chapter is divided into three sections. The first section discusses the research questions, the study design, and the theoretical underpinnings that inform the study. The second section explains the research procedures and includes: ethical issues; the online learning environment used; the two iterations of the study; and the methods of data collection and analysis. Finally, in the last section, triangulation and validity are addressed.

Research questions

This research is framed and guided by two key questions:

- *How can collaborative tools support students' learning in a higher education technology subject in Saudi Arabia?*
- *What are the contextual and cultural factors that support or inhibit students' learning in a blended learning course in Saudi Arabia?*

Research Design

A design-based research approach was used in this study. A qualitative paradigm was adopted to guide data collection that interprets the students' collaborative learning in the context of blended learning environments. This was informed by the theoretical underpinnings from Hofstede's (1980, 2001) dimensions of culture and Hall's (1966, 1976) theory of contextualisation. An action research methodology was utilised within the design-based research approach to allow planning, development, and facilitation of interactions among participants to investigate collaborative learning.

Methodology

Qualitative research

Research can be defined as a way to "understand, describe, predict or control an educational or psychological phenomenon or to empower individuals in such contexts" (Mertens, 2005, p. 2). It has been suggested that the phenomenon must be described by the nature of research which is influenced by the researcher's theoretical framework (Mertens, 2005). A theoretical framework is often referred to as a paradigm and persuades the way knowledge is researched and interpreted (Bogdan & Biklin, 1998). Research paradigms include three elements: "a belief about the nature of knowledge, a methodology and criteria for validity" (MacNaughton, Rolfe & Siraj-Blatchford, 2001, p.32). Qualitative methods are supported by the constructivist paradigm which represents the world as difficult and constantly changing. This contradictory nature of research perspectives are not subject to simple solutions (Tashakkori & Teddlie, 1998). Qualitative research generally emphasises the collection of non-numeric data; that is data from observations, interviews, field notes or transcripts (Creswell, 2003).

Rationale for using qualitative research

According to Neuman and Benz (1998), the selection of research methods should be driven by the research questions instead of the research paradigm. Teddlie and Tashakkori (2002) emphasise the importance of research questions over research paradigms and they recommend that pragmatism should be used as a philosophical approach to guide the selection of the research method. It is easier to be flexible and responsive to the context if qualitative methods are used (Guba & Lincoln, 1989). In this study, the qualitative methods of data collection were used to understand the social interactions among students who participated in the context of collaborative blended learning environments. "The researcher's view of the world, the nature of the research questions and practical reasons associated with the nature of qualitative methods are the reasons for selecting qualitative methods" (Mertens, 2005, p. 230). Based on my observations and experiences in teaching, I have formed different ideas about students' needs and the relationship between teacher and students. My previous study (MEd) also enhanced my understanding of the practical issues relating to the learning environment and the nature of qualitative research methods. Therefore, the qualitative research methods were selected for this study due to the following reasons:

- It assists in examining the complex relationships between the components of the new learning environment (online learning) such as the relationship between the teacher and students, the relationship between the online learning environment and the other relevant factors that affect the implementation of the online learning environment.
- It helps the researcher explore personal, contextual and cultural factors that affect the implementation of collaborative online learning environments.
- It helps the researcher understand the variety of participants' perceptions and how these can influence the implementation of collaborative online learning environments.

To control biases in this study, checking processes such as member-checking and data triangulation were used (Fetterman, 1998). These processes are discussed later in this chapter. Within this qualitative paradigm, action research was identified as an appropriate methodology for this study to foster the examination of the development of collaborative online learning environments.

Research Approach

Design-based research

Design-based research (DBR) was introduced by Brown (1992) and Collins (1992) as a framework to consider when researching learning environments within the development of a variety of educational designs and learning environments based on the theoretical frameworks drawn from previous studies. Then, Reeves (2000; 2006) outlined the main principles of DBR and extracted four phases of DBR based on the primary research conducted by Brown (1992) and Collins (1992). DBR has also been defined as formative research, design experiments, development research, and design research (Reeves, 2000). However, the term "design-based research" is used as it refers to the combination of the study in a learning context and the design derived from the theory of innovative learning environments that emphasises the important role of innovative learning environments in the creation and extension of knowledge in order to develop an educational context (The Design-Based Research Collective, 2003).

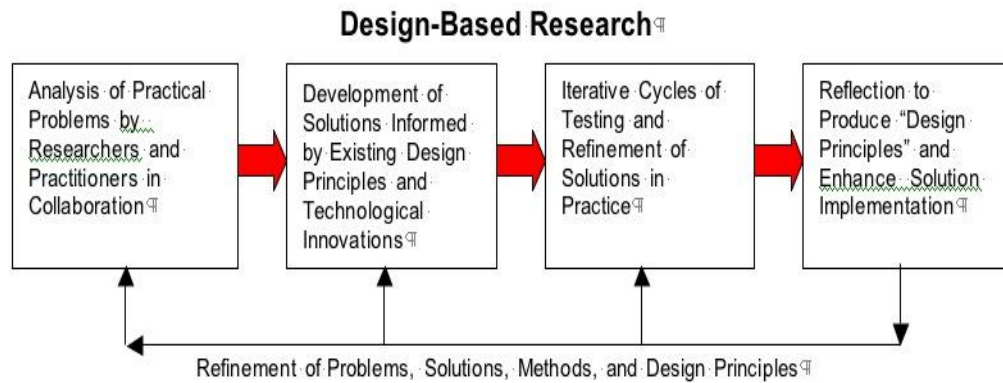


Figure 3.1- Design-Based Research (Reeves, 2006).

The aim of design- based research

Wang and Hannafin (2005) have identified five essential features of design-based research (DBR) based on several studies. First, DBR is pragmatic. It has a practical objective and improves practice and theory. Second, DBR is grounded. Design is determined by theory and practice through relevant research. However, it is developed during the research process. Moreover, it specifies that DBR represents real-world contexts which provide participants with the opportunities to socially communicate and interact with each other. Third, DBR is interactive, iterative and flexible. Participants have the opportunities to collaborate and interact with each other to develop solutions to complex problems. DBR processes are constantly improved and developed within an iterative phase of design, implementation analysis and redesign. DBR processes are also flexible and it is possible to apply changes if necessary. Fourth, DBR is integrative. It uses a range of research methods and approaches, and those methods may vary depending on changes during the different iterative phases of DBR.

In this study, DBR is used as an approach within qualitative methods which are used to establish the credibility of findings throughout the long duration of data collection as well as a deep analysis in order to get greater precision (Creswell, 2003; Reeves,

2006). Fifth, DBR is contextual. Results of the research are based on the design process as well as the particular context in which research is conducted. Based on the above, "The aim of DBR should be not only to design and test a particular intervention but also to understand how and why an intervention works with the particular context in which it is implemented" (Wang and Hannafin, 2005, p.7). In addition, the aim of DBR is to address complex problems in the learning context in collaboration with practitioners and researchers, creating and developing reasonable solutions based on applying existing design principles and technology-based innovations to these complex problems, and testing and refining the innovative learning environment developed by reflective investigation until reaching satisfactory outcomes (Reeves, 2006).

The design, research activities, and methods are mutual in the design-based research approach. Research is concurrently conducted with the design. Consequently, research is design and design is research (Wang & Hannafin, 2003). Pedersen (2004) describes several factors that should be considered while implementing the DBR approach in research. First, the research should be conducted in a representative authentic learning environment. Second, the researcher should closely collaborate with participants. Third, the design should continually be refined to ensure appropriate discipline. Fourth, the design procedures need to be continuously systemised. Fifth, research approaches need to be implemented purposefully. Finally, the data collected should be analysed immediately and continually.

Connecting DBR with this study

The DBR framework was adopted to study the online learning environments. This required gathering applied outcomes with wide research objectives, understanding the existent factors, and implementing them in a development of flexible design. The four phases of DBR (described in Figure 3.1) and how they connect with this study are explained. Reeves (2006) describes the four phases of DBR as; the aim of DBR is to determine educational problems in a learning context in collaboration with

practitioners, develop and utilise possible solutions informed by existing design principles and technological innovations to these educational problems, conduct iterative and reflective cycles of a study to test and refine the solutions developed in the learning environment, and to propose and produce new design principles that could inform future guidance for practitioners in solving similar problems within their educational environments.

Collaborative blended learning environments for Saudi learners

This study attempts to address the educational problem of lack of collaborative learning within Saudi higher education contexts. The solution proposed involves developing and implementing an online learning environment to allow student interaction through participation in collaborative activities in a blended learning course and focusing on a technology subject. A DBR approach was used for this study to investigate the problem mentioned above and to examine contextual and cultural factors that support or inhibit students' learning. DBR was used for this study due to its iterative nature of design and its emphasis on the strong correlation between research, design, and practice. This study was guided by the four phases of DBR outlined by Reeves (2006), represented in Figure 3.1.

Phase 1: Analysis of practical problems by researchers and practitioners in collaboration

The preliminary phase of this study consists of identifying and analysing a meaningful educational problem within a higher education context. In Saudi Arabia, this is seen as the adoption of passive learning in face-to-face classes and the limited adoption of collaborative online learning environments. The literature (Alaugab, 2007; Alghonaim, 2005; Alshehri, 2005; Alarfaj, 2001) has shown that most of research studies in Saudi Arabia have focused on attitude and perception with regard to online education. It seems that there is a lack of research in collaborative online

learning environments in the Saudi higher education context. This study examines Saudi student collaboration in an online collaborative learning environment, and investigates contextual and cultural factors that support or inhibit students' learning in a blended learning course.

Phase 2: Development of solutions informed by existing design principles and technological innovations

This phase of the study includes the development of possible solutions to the preliminary problem as defined in the first phase. This phase is informed by Vygotsky's theory of ZPD (1978) as a principle that guides the development of online collaborative learning (Vygotsky, 1962, 1978). As Vygotsky's theory emphasises social interactions among learners in the learning process, this has influenced the creation of the online version of the course called "*Producing and Using Instructional Tools*". This subject was formerly taught face-to-face at King Faisal University in Saudi Arabia. It was modified to include collaborative course activities within online learning environments to enable student interaction and collaboration through a number of online communication tools including discussion forums, chat, email and journals. Two aspects of the subject were changed. Firstly, the mode of teaching was changed from a face-to-face context to an online one. Another change that was made to the subject was introducing collaborative learning.

Several studies (Freeman, 1995; Johnson & Johnson, 2004; Lejk, Wyvill & Farrow, 1996; Rafiq & Fullerton, 1996) have shown the powerful impact of collaborative activities on student learning. It is for this reason that the subject was substantially changed to make collaboration an important part of learning. Two collaborative tasks were designed to enhance the social interactions among students and were used in both iterations. These are described under data collection methods. The first task required students to plan and discuss different topics with their group members to create a website about using technology in Education. Students were asked to discuss their topics and prepare their design with peers through face-to-face and online

discussions using the online communication tools provided. The second task required students to create a podcast or video narrative. In this task, students were required to select either creating a podcast about using synchronous/asynchronous tools in Education on an audio file or creating a digital narrative about using mobile phones in Education on a video file. Students were also asked to discuss their topic and prepare their design with their group members based on face-to-face and online discussions. In order to complete each task, students were required to collaboratively work and interact with each other using the online communication tools provided in the course website. Students were also provided with various resources such online readings to help them complete each task.

Phase 3: Iterative cycles of testing and refinement of solutions in practice

The third phase includes the implementation of the solutions from the second phase of this study. In this phase, two iterative cycles of testing and refinement were implemented within the context of a first year IT class for higher education students. Data was collected, analysed, and evaluated before, during, and after each of the two iterations using observations and interviews. Data was collected through class observation as well as semi-structured interviews with the participants. Numerous artefacts and documents were collected in this phase, such as students' postings in the discussion forum, students' online interactions in the chat tool, students' reflections in the journal tool, and students' email messages in the email tool. Students' interactions from online communication tools for collaborative course tasks were also collected and analysed.

Reeves (2000) and van den Akker (1999) stress the need for rigorous testing of the principles that have initially been identified in order to permit procedures for their modification and refinement under the guidance of emerging evidence from the analysis of data. To accomplish this, the two iterative cycles were guided by action research methodology to investigate students' interactions throughout Phase Three as

the context of IT higher education students was tested as a solution for developing an understanding of the collaborative blended learning environment. Each iterative cycle is described in the second section of this chapter.

Phase 4: Reflection to produce design principles and enhance solution implementation

In Phase Four, the data collected from Phase Three of this study was documented and reflected upon in order to produce new guidelines for design principles which may be able to address similar issues or problems within other educational contexts.

DBR connected with qualitative methods

Many researchers debate which research methods (qualitative, quantitative or mixed methods) are most appropriate for a research design (Denzin & Lincoln, 2000), particularly when these methods are implemented along with a design-based research approach in educational practice (Dede, 2005). As design-based research is an empirical and descriptive approach, it should rely on methods that are able to demonstrate the relationship between the process of specific performance and a particular outcome. Qualitative methods are descriptive methods that are able to assign the connection between the performance and outcome derived (Sandoval, 2004). Therefore, qualitative research methods were used with a design-based research approach for this study.

Sandoval (2004) argues that the research design must be documented to understand variables, the aspects of the changed environment, and its relation to the observed outcomes. This aspect was applied in the two iterations of this study when the online learning environment was used with two different cohorts of students over two semesters. The two iterations provided an opportunity to collect data from several artefacts and documents and provided valuable indicators for interpreting qualitative

data from students' interviews, class observations, engagement with online learning environments, and participation in online collaborative learning environments through the online communication tools.

Different research studies have used the design-based research approach as an experiment to develop the educational context at tertiary level (Lacro, 2013; Singh, 2009). Lacro (2013) studied student success within active and collaborative learning. This study attempted to examine the relation between social networking technologies, academic coursework and student success by increasing the students' self-efficacy levels. Lacro (2013) used the design-based research approach to focus on using technology as a process because it was supposed that the design-based research framework increases social interactions amongst students and then, increases levels of self-efficacy. Lacro (2013) found that there was a direct effect of peer interaction on course completion and self-efficacy. However, there was indirect impact of social networking technologies on student success.

Singh (2009) used the design-based research approach to examine the development of a web-based module by using an Instructional Systematic Design (ISD) process to teach particular learning strategies to students at tertiary level. The design-based research framework was used to create related outcomes for participants in IT field. Singh (2009) found that the use of Instructional Systematic Design (ISD) was applicable to develop an interactive web-based module for students in higher education. Moreover, this study found that the use of the design-based research approach contributed to add useful results to the body of IT research and provided support to the instructional technology discipline.

The design-based research approach has both a prospective and a reflective nature (Cobb, Confrey, diSessa, Lehrer & Schauble, 2003). DBR is a prospective as it is "implemented with a hypothesised learning process and the means of supporting it in mind in order to expose the details of that process to scrutiny" (Cobb et al., 2003, p.10). However, its reflective nature refers to the generation and testing of "more

specialised conjectures" (Cobb et al., 2003, p.10) that can be obtained from continuous reflection and analysis during the study. In this study, the prospective face included testing hypotheses regarding students' learning within interactive environments. It was assumed that the implementation of collaborative course tasks with face-to-face instruction would provide students with better opportunities for learning. The reflective face of this study included the design of an online learning environment and the online communication tools, and testing conjectures about their use, effect, and support for student learning.

Action research

Action research is a methodology of research that pursues action and research outcomes at the same time (Carr & Kemmis, 1986). The aim of this methodology is to obtain new knowledge and new perspectives that lead to developing educational practices (Stringer, 2004). Action research can be involved in qualitative, quantitative or mixed research methods. However, it engages with the qualitative paradigm in this study.

There are three principles that characterise action research. It is cyclic, participative and reflective (Mertler, 2006). Action research is guided by these principles:

- Similar stages or steps of research tend to recur in a similar series that allows responsiveness (Checkland, 1981). Therefore, action research should be able to respond to the needs of the circumstance.
- Participants and information need to be involved as partners or be active in the research process.
- Critical reflections of the research process as well as research outcomes are important for each cycle of the research. In each cycle, the researcher and participants work together to recollect and critique what has already occurred. This will increase understanding for designing the first step of later stages (Guba & Lincoln, 1989; Mertler & Charles, 2005).

Mertler and Charles (2005) illustrate the processes for action research in four stages; planning, acting, developing, and reflecting (Figure 3.2; next page). In order to connect these stages in this study, planning is based on identifying and analysing the educational problem within a higher education context as provided in Phase One of this study. This plan leads to the creation of the design of online learning environments for higher education students within a collaborative blended course. In the acting stage, observation, interviews, and reflections from students informed the development of the next cycle.

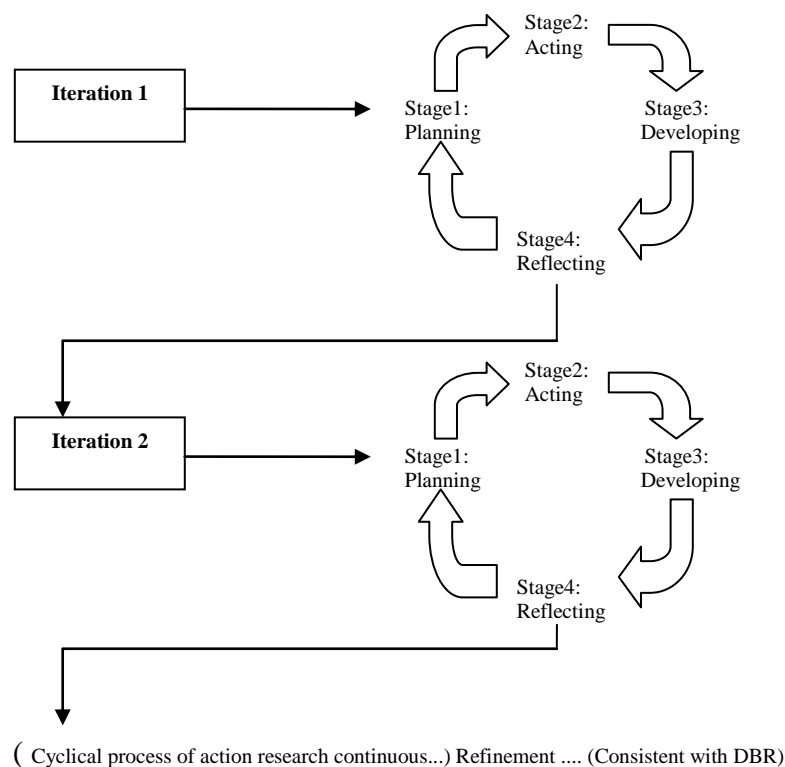


Figure 3.2- The Process for Action Research within a DBR framework (adapted from Mertler & Charles, 2005).

Action research and design-based research

Action research as a methodology provides opportunities for teachers to perform as researchers in the educational field. This allows teacher-researchers to continuously plan, act, evaluate, refine and reflect on their practice (Carr & Kemmis, 1986; Stringer, 2004). Action research methodology relies on the traditional social change and depends on reflection and action (Mertler, 2006). On the other hand, design-based research approach offers several aspects that link with action research, but it is more likely to support systematic study process (Cobb et al., 2003). It is concerned with the development of learning contexts and a precise study of particular forms of learning generated these learning contexts (Reeves, 2006). This approach also involves a constant process of testing, reflection and revision to refine the design of the learning environment.

Within this study, design-based research was used as the approach and action research was used as the methodology. These work together well as they are both cyclic, participative, and reflective.

Research procedures

This section describes ethical procedures that were conducted prior to and during the investigation of this study. Online learning environments in the blended course within the selected context are described. In addition, the two iterations of the study and the methods of data collection including observations and interviews are described. The participants, focii, data collection process for each iteration, and the data analysis methods are presented. Finally, triangulation and validity are addressed.

Ethical issues

Ethical approval was gained from The University of Wollongong's Human Research Ethics Committee before the commencement of data collection for this study (HE09/243). Following this, King Faisal University (KFU) (the context of the study) was contacted to obtain permission and discuss regulations about conducting research on the premises. Each participant was provided with participant information sheets (translated in Arabic) and informed about the purpose and procedures of the study (see Appendix 1). A consent form was also translated in Arabic and signed by each participant before the commencement of the study (see Appendix 2). Moreover, the participants were informed that they had the right to withdraw at any time during the study with no any adverse effects on them. They were also able to withdraw data concerning themselves if they withdraw their consent. The researcher in this study was also the class teacher.

The interviews, questions, and observation checklists were translated into Arabic by the researcher and reviewed by two Assistant Professors who mastered both

languages in the Department of English Language at KFU. Some advice was also given by them for translation back into English. To meet ethical considerations, a Research Assistant conducted the interviews, and marked the students' assignments and exams, as students were in a dependent relationship with the researcher (myself) who was also their teacher. The interviews were anonymously transcribed prior to myself having access to the participants' views. Additionally, the employment of an objective Research Assistant minimised the risk of any negative consequences on students for their views. I accessed these interviews after each session.

The online learning environment (course description)

The major purpose of this subject is to identify different types of instructional tools, including traditional tools such as blackboards or whiteboards as well as web-based instructional tools such as computers and HTML tools. Also, this subject identifies how to use these tools, classify them, and find significant relationships between the instructional tools and the elements of educational communication. Furthermore, it allows learners to understand the norms and basic knowledge in producing different types of instructional tools based on the nature of the educational context. Collaboration and significant sharing of resources and knowledge are supported by online group work, and the teaching approach encourages students to participate and interact within groups to solve particular problems (Hansford & Wylie, 2002).

Three teaching strategies were used to guide students to complete two collaborative tasks (see Appendix 3). These strategies are group discussions, think-pair-share, and syndicate strategies. The group discussion strategy is an arrangement of students into groups to contribute in a variety of activities to develop thinking skills or to accomplish tasks (Bennett, 1991). Think-pair-share is a collaborative learning strategy that encourages students to think about an idea or issue, and then share their thoughts with a peer before discussion in a group (Murdoch, 1998). Syndicate is a strategy which allows a group of students to act collaboratively to complete tasks, develop skills, or discover a new issue surrounding knowledge (Murdoch, 1998). All

tasks of this course were group tasks. The first task was about creating a website. Students were asked to complete this task based on their online discussions as well as the face-to-face discussions within their groups. The second task was about producing a podcast or video narrative. Students were asked to choose one option; either producing a podcast or a video narrative. Students were also required to complete this based on their online discussions as well as face-to-face discussions within their groups. The two collaborative tasks of the course are described in the data collection methods.

During Phase Two of the study, blended learning environments were designed and developed, and collaborative learning environments were implemented to allow students to interact and collaborate with each other through a range of tools provided on the course website such as a chat tool, the discussion forum, email, and journal tools. The chat tool was designed for "live" real-time discussions. It also was designed as a teaching tool for the groups of students to discuss particular issues about the topics in the course. For example, it was used to discuss the types of instructional tools. It was also used to answer groups of questions. In addition, the discussion forum was designed to enable students to engage in virtual seminars. The students were asked to respond to the teacher with this tool, and were also asked to respond to each other. The email tool was designed and used by the teacher to send announcements and reminders for all student groups. In addition, students were asked to use this tool to contact the teacher and group members. The journal tool was designed for the students to reflect on the content of the course and their learning.

The data was collected in this study based on students' interactions and discussions of their tasks via the online tools that were provided. The students' behaviours and beliefs regarding technology, their ability to interact within online learning environments, their perceptions about online learning, their expectations on the effectiveness of online collaborative learning, and factors that may affect the integration of collaboration and technology in the learning process were considered.

Data collection methods

Data collection enables researchers to respond to their questions, and inform their conclusions and recommendations (Merriam, 2001). Furthermore, the collection of data helps researchers foster what they desire to discuss in practical settings. Qualitative data collection methods were used in this study (see Appendix 4). Descriptive and detailed information about the participants' perspectives, motivations, interactions and difficulties in using the Blackboard site as an online learning environment were collected by observations and interviews. These methods are recommended by some researchers (Gay, 1996; Marshal & Rossman, 1995; Patton, 1990; Yin, 1989). The interviews and observations were used before and during the two iterations of this study. The interview questions and the observation topics were initially reviewed by two experts in blended learning in the Faculty of Education at the University of Wollongong.

Observation

Observation can be defined as a systematic description of events including different behaviours that might occur in the social setting selected for a particular study (Erlandson, Harris, Skipper & Allen, 1993). A moderate level of observation was chosen for this study. The role of the researcher is then to "attempt to balance the insider and outsider roles by observing and by participating in some but not all of the activities" (Mertens, 2005, p. 382). The most significant advantage of observation is that the previously ignored or unseen facets may be observed (Kellerhear, 1993). In order to examine the student's collaborative learning, transcripts from the chat tool, discussion forum, participants' comments and comments on personal reflections in the journal tool, and their questions and comments on email were collected. The observations focused on social interaction between students themselves and between them and their teacher. I also kept a diary during the progression of the course.

Each student participant was observed by myself for two hours in the classroom based on the involvement of the two collaborative tasks, both online and face-to face, and there was a particular focus on different aspects while observing the IT higher education students for each iteration of the study. First, there was a focus on the social interaction between students themselves and between them and their teacher. Second, in order to examine the student's collaborative learning, transcripts from the chat tool, discussion forum, participants' comments and comments on personal reflections on the journal tool, and their questions and comments on email were observed and collected. All observation sessions as well as field notes were in adherence with the observation checklist. To explain this, student interaction in the discussion forum to complete the tasks were observed, collected and coded (task definition, task process, confirmation, suggestion.... etc) at the sentence level during the task completion (see Appendix 6). Each student's statement is coded to see how the group members reached their final decision to complete their tasks. The data collected from observation in the two iterations are analysed in chapters 5 and 6. Table 3.1 shows the observation protocol used.

Table 3.1 Observation checklist.

No	Topics of observations
1	<i>Students' collaboration via Discussion forum during the course.</i>
2	<i>Students' collaboration via Chat tool during the course.</i>
3	<i>Social interactions between students themselves during the collaborative tasks.</i>
4	<i>Social interactions between students and their teacher during the course.</i>
5	<i>Students' Comments on personal reflections via Journal tool during the course.</i>
6	<i>Students' Comments and questions via Email tool during the course.</i>
7	<i>Recorded observations in the researcher's journals at the conclusion of each session.</i>

Although observation has important advantages, it also has some disadvantages, such as researcher bias. According to Denzin and Lincoln (2000), the reason for

researcher bias could be due to the researcher's tiredness or undisciplined attention. Observation is not always able to provide the researcher with repeated, expanded, and close information of the involvement of the participants (Mertens, 2005). The semi-structured interview method was used to collect data for the study along with the observations.

Interview

An interview can be defined as a conversation with a purpose that allows the information to be gathered from the interviewee (Berg, 2001). In addition, it can be defined as a sequence of procedures used for collecting oral data in a particular group (Brown, 2001). The main purpose of the interview is to obtain what the participants feel, think, and believe (Patton, 1990). According to Rose (1991), the most significant advantage of interviews is that it is direct interaction with interviewees. Elliott (1991) describes the interview as essential to qualitative action research because it is able to provide useful information about the contexts in which the interviewee participates. So, the researcher is provided with an opportunity to gain an explanation and a deeper interpretation of the issues posed. The aim of the interview in this study was to permit the researcher to collect data which could not be obtained from observation alone. Semi-structured interviews are particularly helpful because worthwhile thoughts may instinctively emerge from both interviewer and interviewee within the interview (Elliott, 1991). Three semi-structured interviews were conducted with each selected participant. The selected student participants were interviewed before, during, and after their involvement in the collaborative blended learning environments as part of the 15 weeks of study for each iteration of the study. These student participants had varying levels of ability and confidence in using technology.

All interviews were semi-structured. The purpose of the preliminary interview was to allow the researcher to obtain different perspectives on social and cultural backgrounds of participants toward their use of technology, their beliefs regarding technology, and personal factors that affect the use of technology (see Appendix 10).

In this example, in the first iteration, students from group A indicated that they live in large families of six to ten members and they had experienced face-to-face instruction in high school and at university (SPI6.3). The purpose of the second interview was to obtain the information about the difficulties that the participants have confronted with collaboration and their use of technology (see Appendix 10). In this example, in the first iteration, a student from group A reported that the lack of Internet access in the computer lab was a factor that limited completing Task 1 (SII10.4).

In addition, the post interview was to allow the student participants to more deeply describe the difficulties that they have faced during the implementation of online collaborative learning environments, and to describe the online tools they preferred to use during the use of online learning (see Appendix 10). In this example, in the first iteration, a student from group A reported that the lack of Internet and computer access in the computer lab impacted upon the completion of Task 2 (SPOI29.5). The interview questions included inquiries on students' social and cultural backgrounds, the type of online tools they prefer to use during the implementation of the course, and personal factors that influence the implementation of online collaborative learning environments. They also were asked to specify their preference level for traditional teaching methods (see Table 3.2). The data collected from these interviews in the two iterations are analysed in chapters 5 and 6.

All student participants were individually informed about the study's objectives before they were interviewed. Interviewees are more confident to talk and more communicative answering the questions they are asked when they are within a familiar environment (Creswell, 2003). Therefore, all interviews were conducted at KFUPM. Each interview was face-to-face and took approximately 20 minutes. Each interview was recorded using an audio recording device to aid in later transcription. Moreover, the consent was given by the participants before any recording started. Only relevant parts of the transcriptions were translated.

Table 3.2 Topics of interviews.

Preliminary interview	<ul style="list-style-type: none">- Students' social background.- Students' cultural background.- Students' beliefs regarding technology.- Students' personal factors that affect the use of technology.
Second interview	<ul style="list-style-type: none">- The difficulties that students have confronted within their use of technology and collaboration.
Post interview	<ul style="list-style-type: none">- To more deeply describe the difficulties that students have faced during the implementation of collaborative online learning environments.- To describe the type of tools they preferred to use during the implementation of the course.

Student work products

Student work products can be defined as recorded or written material that is organised for a professional reason or particular purpose (Lincoln & Guba, 1985). This can be represented by different examples such as work samples, classroom artefacts, plans or documents (Mertler, 2006). In addition, Lincoln and Guba (1985) noted that collecting and analysing texts and artefacts created and utilised by individuals as data can enhance understanding of phenomena. These products or documents help the researcher to focus on how and for who the product is created, what is included and not included in the product, and how the product is used (Mertler, 2006).

In this study, the student participants in each iteration were required to develop two collaborative tasks. The first was a website. In second task, they had the option of creating a podcast or video narrative. Each group was required to discuss the topics of the products in face-to-face mode and via online tools on Blackboard. The collaborative tasks are described in Table 3.3

Table 3.3 Collaborative tasks of the course.

Task	Requirements
Task 1: Create a website	<ul style="list-style-type: none">- Students are required to discuss the topics within their groups.- Topics are discussed face-to-face.- Topics are discussed via online tools (minimum of 5 postings using the discussion forum tool).
Task 2: Podcast or video narrative	<ul style="list-style-type: none">- The student either creates a podcast or a video narrative.- Students are required to discuss the topics within their groups.- Topics are discussed face-to-face.- Topics are discussed via online tools (minimum of 5 postings using the discussion forum tool).

For the first task, groups were required to produce a website examining the effectiveness of using technology in Education and discuss different examples and topics of using technology in Education using an appropriate format for their design. Students were required to first prepare a plan of their website of approximately 500 words. Each group website was analysed for appropriateness of the website format, discussion of topics relating to use of technology in Education, appropriate examples of effective of using technology in Education, clarity of expression and general presentation as well as evidence of development of ideas in online interactions (see Appendix 3). In this instance, in the first iteration, students from group C submitted 650 words in the Blackboard in order to complete Task 1. Their plan was to discuss different topics such as definition of using technology in Education, examples of using technology in Education and Saudi educational problems and solutions. This group created a website including three topics (definition of technology, the importance of using technology in Education and the reasons for using technology in Education). Data from the group work product were collected and analysed.

For the second task, students were required to prepare a plan of their product of approximately 500 words. They were also required to produce a podcast about using synchronous/asynchronous tools in Education or a video narrative about using mobile phones in Education. Each group product of this task was collected and analysed to examine the appropriate discussion of the topics, satisfactory presentation of the product, appropriate design and development of the task, clarity

of expression and general presentation, and evidence of development of ideas in online interactions (see Appendix 3). The data collected from student work products in the two iterations were analysed in chapters 5 and 6.

Despite the advantages of work samples such as neutrality, capitalising the data and exploring student products, this type of data analysis may not be able to fully address specific research questions (Merriam, 2001). In this study, student work products were collected to analyse for connections between group online discussions, product content and meaning-making. Student products were transcribed and translated in English for analysis.

My background as a teacher and researcher

I had taught students in Saudi Arabia for three years before the commencement of this doctoral study. This experience as well as my previous study (MEd) have allowed me to begin to understand the students' needs and to develop rapport with the students in the university learning environment. This has reinforced my perception of significant issues in the educational setting connected with the nature of the study. I received my Master's degree in Australia and through which had the opportunity to experience and engaged with several blended learning environments. These environments provided me with insight to help conceptualising how I might actualise the focus of this research. In addition, I share a similar Arabic cultural background and have had similar learning experiences with the student participants. Being familiar with blended learning environments and with the same cultural background of the participants tended to help me understand the study context and operate within it accordingly.

In terms of researcher biases and the influence on the participants, the Teaching Assistant conducted the interviews and transcribed them before the researcher (myself) having access to the participants views. The Teaching Assistant also marked student assignments and exams, as the student participants were in a dependent

relationship with the researcher as teacher. The Teaching Assistant was not directly involved in the frequently observations during the course. His involvement could mitigate researcher bias and influence on the participants, but the researcher like other researchers may have been located in some unintentional biases which have become one of the natural and common criticisms, especially for qualitative researchers (Creswell, 2007).

Iteration 1

The first iteration of this study was conducted in the first semester of 2010. As mentioned, this iterative cycle was designed and developed in Phase Three of this study, as guided by the design-based research approach.

Participants

The participants were fifteen education students in a first year IT class at KFU in Saudi Arabia. I was given a list of students who enrolled in the subject "*Producing and Using Instructional Tools*", which is being taught face-to-face in the faculty of Education at KFU, and I randomly selected fifteen students from the list to participate in the data collection procedures. I was given consent of participation from all selected participants.

Focus

Students were asked to complete the two collaborative tasks described in Phase Two of the study over fifteen weeks of the semester, and to collaborate, interact and communicate with each other both online and face-to-face. The first iteration was conducted to determine the effectiveness of the online learning environment, and to identify any issues or problems related to the design of the collaborative activities, the collaborative learning among participants, and the technology (online tools) used

to support this collaboration. In addition, the first iteration was undertaken to provide data that assisted with the refinement of the second iteration of this study.

Data collection process

Before the commencement of the online collaborative learning environments, I explained in detail how to use the course website to the participants, and a period of time was given to them to investigate the online resource. In addition, preliminary interviews were conducted by Research Assistant with the students and they were randomly divided into five groups. All student participants had an opportunity to play with the online tools and introduced themselves using discussion forum tool for about twenty minutes. I also encouraged them to discuss the first collaborative task face-to-face with their group members for about twenty minutes before they use the online tools.

During the fifteen weeks of the semester, students were asked to attend two hours of class time per week in the computer lab at their university. This included a face-to-face lecture using the course website for collaborative learning and discussing their collaborative tasks (see Table 3.4).

Table 3.4 Class activities.

Duration	Activities
1 – hour	Lecture + face-to-face class discussion.
20 – minutes	Reading – study.
20 – minutes	Using online tools of the course website.
20 – minutes	Discussion of collaborative tasks.

In order to meet the aim of this study and to encourage the student groups to use the online tools (discussion forum, chat, journal and email tools) provided in the course website, I organised the collaborative learning environment of the course with the following activities:

- Supporting online activities were posted every week to the students to help them understand and discuss the two collaborative tasks face-to-face and via the discussion forum with their group members on the course website.
- A synchronous chat session was organised every week on the course website via the chat tool for an hour out of class time to discuss the requirements of the two collaborative tasks with the students.
- The students were given twenty minutes every week during the class to reflect on their learning and the content of the course via the journal tool on the course website.
- The students were encouraged to use email on the course website to contact the teacher and group members for comments, discussion and/or questions.

During the first iteration, the second semi-structured interviews were conducted by the Teaching Assistant with the students in week seven of the semester. The post interviews were conducted in week fifteen. All interviews were transcribed in Arabic and later translated into English. Moreover, documents and artefacts such as transcripts from the chat tool, discussion forum, participants' comments and comments on personal reflections in the journal tool, and students' comments and questions in email were collected and analysed in this phase of the study.

The data analysis began at the commencement of the data collection process. During and after the first iteration of the study, the analysis of data revealed a number of problems that needed to be addressed before the commencement of the second iteration, such the students' skill levels within the collaborative groups, the level of support for the collaborative tasks, and the use of online tools provided on the course website. All the problems were addressed and the course was redesigned before the commencement of the second iteration of the study. Figure 3.3 shows how this research cycle works in the phases of DBR (next page).

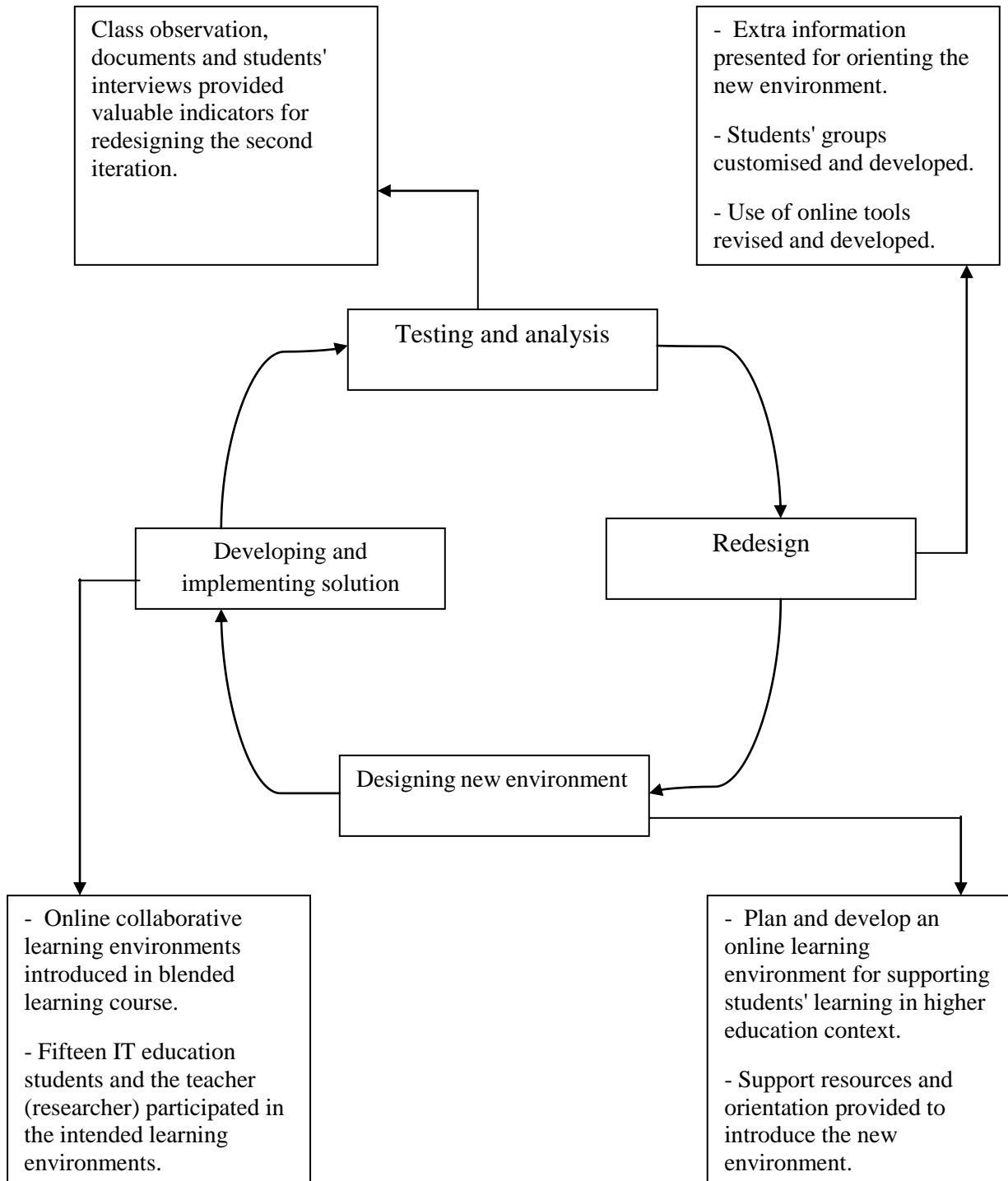


Figure 3.3 – Design of iterative cycle 1.

Reflections from iteration 1

The first stage of data analysis of the first iteration of the study revealed a number of problems that were related to the students' collaboration skills in group work, the level of support for the collaborative tasks, and the use of online tools provided in the course website. To solve these problems, the second iteration of the study was refined and redesigned based on the following actions:

- More time for explanation of how to use online tools in the course website was given to the students.
- Supporting online activities were increased to help the students deeply understand the collaborative tasks and to encourage them to participate in the collaborative learning environments.
- The students were asked to group themselves with three members before the commencement of the data collection process in the second iteration to foster harmony within groups.
- The students were asked to participate in a minimum of five chat sessions to encourage them using this online tool for collaborative learning.

These guided the choices made in iteration 2. More discussion of iteration is located in Chapter 5.

Iteration 2

The second iteration was conducted in the second semester of 2010. This iterative cycle was also designed and developed in Phase Three of this study as guided by the design-based research approach. This research cycle was redesigned and developed based on the analysis of data collected in the first iteration. The redesign of this cycle involved a more thorough introduction to the new environment for the participants with customised student groups and a revised participation protocol for the online tools provided.

Participants

The participants of the second iteration were a new cohort of fifteen students, the researcher who was also the class teacher (myself), and a Teaching Assistant who conducted the interviews, and marked students' assignments and exams. The student participants were randomly selected by the same method that was used for the first iteration of the study.

Focus

The student participants were also asked to complete the two collaborative tasks described in Phase Two of the study over fifteen weeks of the semester, and to collaborate, interact, and communicate with each other both online and face-to-face. The second iteration was conducted to find out the effectiveness of the online learning environment which had been customised and developed to foster student learning. This iteration also aimed to identify the issues or problems related to the design of the collaborative activities, the collaborative learning within developed students' groups and, the refined participation in the online tools to support this collaboration. Moreover, this iteration was undertaken to provide data that may assist with refinement for future research design.

Data collection process

In this research cycle, data was also collected from participants through the three semi-structured interviews (preliminary, second, and post interviews) over fifteen weeks of the semester. Each interview was conducted and transcribed by the Teaching Assistant before the researcher (myself) having access to the participants' views. During the fifteen weeks, the participants were also divided into five groups and were required to attend two hours of class time per week in the computer lab at KFU, including a face-to-face lecture, using the online tools provided, and discussing their collaborative tasks. In addition, similar activities were provided for the students

to use the online tools (discussion forum, chat, journal and email tools). The students' interactions were observed. Documents and artefacts such as transcripts from the chat tool, discussion forum, participants' comments and comments on personal reflections in the journal tool, and students' comments and questions by email were collected for analysis in this phase of the study. Figure 3.4 shows how this research cycle works in the phases of DBR (next page).

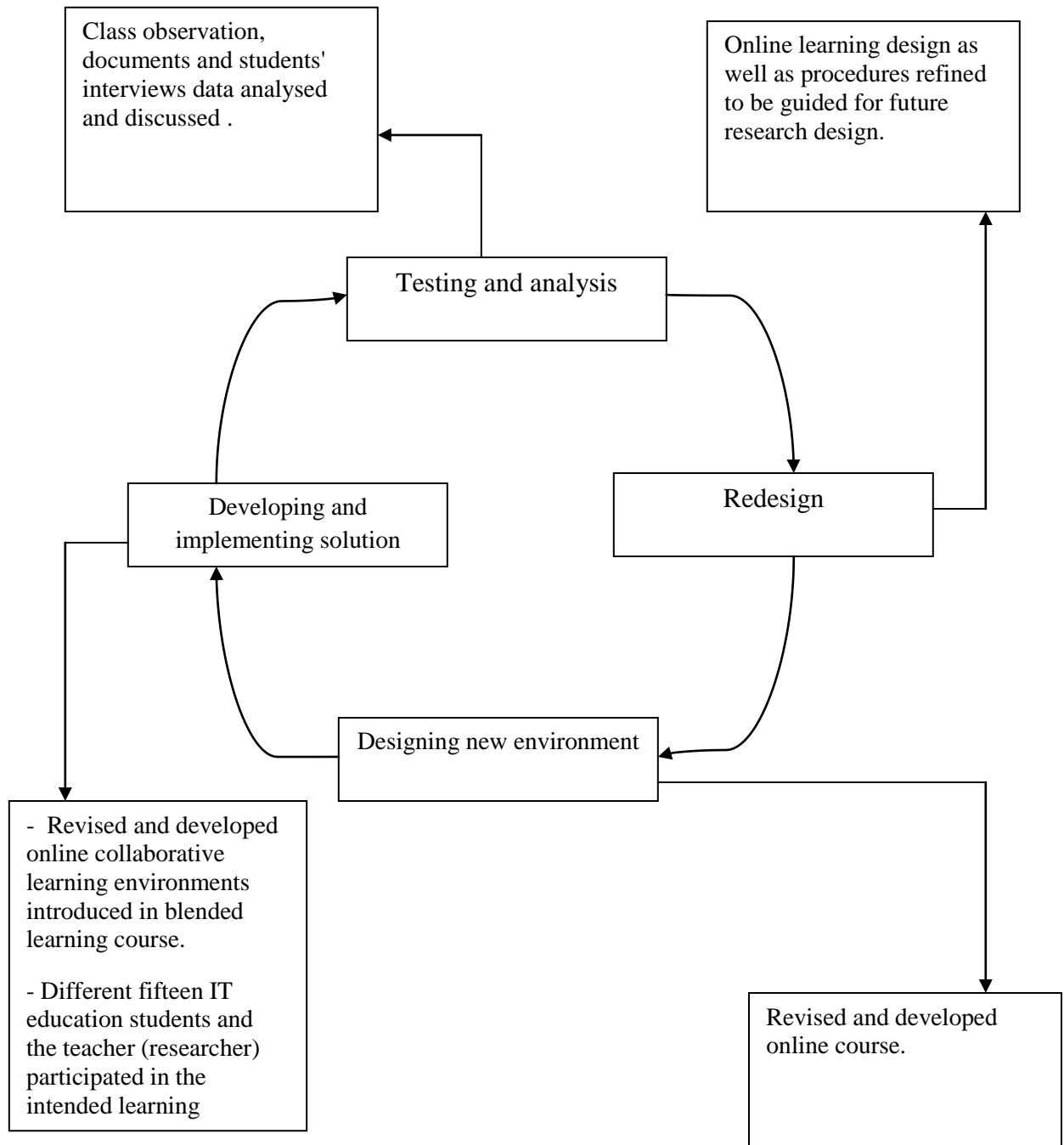


Figure 3.4 – Design of iterative cycle 2.

Data analysis methods

Erlandson et al. (1993) have suggested that the collection and analysis of data are supplementary, continuing, and frequently simultaneous processes. In this study, this has been of paramount importance. There is question about how much data should be analysed and interpreted in a qualitative research report (Erlandson et al., 1993). There are five ways that can be considered as the most common ways in reporting the research findings. Those ways are description, explanation, criticism, interpretation, and action advocacy. However, it is common that more than one approach could be used at the same time (Potter, 1996). My principal goal in this study is to describe the research findings by seeking similarities, differences, themes, concepts, correspondences, categories, and ideas, and presenting some interpretations if necessary to adequately respond to the research questions. Glaser and Strauss (1967) suggest the use of constant comparative methods for data analysis. This method was used in this study to enable me to engage with continuous analysis of data collected throughout the two iterations.

Qualitative data from observations including face-to-face and online contexts were used to examine the students' interactions within collaborative learning environments. The analysis of classroom observation in the face-to-face context was used to investigate the students' participation and interaction during the course. Furthermore, the analysis of observation transcripts from online communication tools (discussion forum, chat, journal, and email) was used to examine the students' participation and their interaction between themselves and between them and their teacher (myself) in the online learning environment. Specifically, the analysis of the journal tool transcripts was used to examine positives and negatives of the subject, the content of the subject, the teaching approaches used, and perceptions of the learning environment (see Table 3.5). The semi-structured interviews were used to investigate contextual and cultural factors that support or inhibit student learning. The analysis of interview transcripts was used to explore the students': cultural and social backgrounds; preferences of online tools; perceptions; personal factors; beliefs

about technology and collaboration; and difficulties with technology, the subject content, group work, and technical support (see Table 3.5).

Table 3.5 Analysis of research questions.

Research questions	Methods	Analysis
Q1: How can collaborative tools support students' learning in a higher education technology subject in Saudi Arabia?	Observation	- Observation transcripts were analysed to understand students' participation and interaction within the context. - Transcripts were analysed and compared with the other data sources.
	Student work product	- Data sources were analysed and compared.
Q2: What are the contextual and cultural factors that support or inhibit students' learning in a blended learning course in Saudi Arabia?	Observation	- Transcripts from the journal tool were analysed to explore contextual factors that support or inhibit student learning.
	Interview	- Transcripts from interviews were analysed to explore cultural and social factors that support or inhibit student learning.
	Student work product	- Data sources were analysed and compared.

Transcripts of observation categories such as participants' comments, responses on personal reflections, and social interactions between students themselves and between them and their teacher (transcripts from discussion forum, chat, journal and email tools) as well as interview categories such as the students' social and cultural background, their beliefs regarding technology, the difficulties that they confronted within their use of technology and/or collaboration, the personal factors that affect the use of technology and/or collaboration, and the type of online tools they preferred

to use during the implementation of the online learning environment were key to the analysis process. All the interviews were transcribed and translated. All transcriptions were carefully read and saved for easy recall. Texts that included key words were highlighted and saved. Any additional comments were also typed, numbered, and saved in a comment sheet or in my diary.

In order to develop a consistent analysis of the data, concept maps and a coding system were developed. In order to combine inductive category coding with a simultaneous comparison of all social interactions observed, a constant comparative method was used to analyse the data for themes and patterns (Merriam, 2001). Data sources informing this study were compared and analysed. Observation transcripts were analysed and compared with the data from interview transcripts. Similarly, interview data was compared with the observation transcripts of student participation and interaction and analysed. The codes assigned are used for the aims of an audit trail (see Appendix 4). These codes indicate the data sources reported in this study.

Triangulation and validity

This section of the chapter describes how the biases of this study were addressed through triangulation of data sources. As this study relied on a qualitative research paradigm as the single research method, this study was faced with some considerations around validity, misinterpretation of participants' meaning, researcher biases and researcher influence on the participants. Different strategies were implemented in this study to reduce the potential of these problems. These strategies included rigorous involvement in the learning environments by the researcher, member checking, the researcher's role of shared cultural background, the use of the participants' native language, and the role of the Teaching Assistant (Creswell, 2007; Merriam, 2001 & Myers, 1997). The data collected from multiple methods (interviews, observations, and sources from teacher and students) in qualitative research is defined as triangulation (Denzin & Lincoln, 1998; Lincoln & Guba, 1985).

The rigorous involvement in the learning environments by the researcher (myself) and member checking reduced the problems of misinterpretation of the participants' meanings. My rigorous involvement was supported by the multi-session of interviews, the frequent observations during the course, and the role of the researcher as the teacher and participant in the learning environments within the study. The Teaching Assistant was also present in each instance of data collection. The sequential interviews and observations enabled me to examine particular themes which drew from participants in the previous interviews and/or observations. In regard to member checking, the student participants were provided with general themes of the study that derived from the data to enable keep continuous feedback and reflection, ensuring that my interpretations of their meanings were accurate. This allowed me to reach a deeper understanding about student learning during the study. In addition, I share the student participants' cultural background (Arabic cultural background) which reinforced the possibility of understanding the participants' meanings (Hess-Biber & Leavy, 2006). The use of the participants' native language in the online collaborative learning environment and in the interviews also reduced the prospect of misunderstanding the participants' meanings.

In terms of researcher biases and the influence on the participants, the role of the Teaching Assistant in this study was to conduct the interviews and transcribe them before the researcher (myself) having access to the participants views. The Teaching Assistant also marked student assignments and exams, as the student participants were in a dependent relationship with the researcher as teacher. This mitigated researcher bias and influence on the participants.

Summary

The purpose of this chapter was to describe the methods used to investigate student collaboration in Saudi higher education through the use of online collaborative tools to compliment the face-to-face experiences offered. The study aims to examine how these tools may support student learning through group tasks orchestrated and

completed within an online learning environment. Throughout the two iterations of this study, particular attention was paid to contextual and cultural factors that could potentially support or hinder student learning in the blended learning environment. In the research design, a qualitative paradigm was employed. Furthermore, a design-based research approach incorporating an action research methodology was used. Ethical issues around the research, the online learning environment, and the data collection methods were described. The two iterations of the study were demonstrated. In each iteration, the participants, research focus, and data collection processes with connection to the data analysis methods were addressed. Finally, this chapter addressed the study's credibility through the use of data triangulation and validity measures.

Chapter 4

Descriptions of the Iterations

Introduction

This chapter describes the two iterations of this study. Information about the subject taught to the student participants is presented. In addition, the blended learning environment, including the face-to-face context and the online learning environment (Blackboard) created for the study are elaborated. The participants' backgrounds and their learning experiences were captured through collected data within the first iteration, and reflections on this iteration are described. Following this, the redesign of the second iteration and the new participants' backgrounds are presented. The students' learning experiences from the second iteration are then described. Finally, this leads to reflections on the iterations and a subsequent discussion.

The subject

The research focused on one subject within the Bachelor's degree of Education at King Faisal University (KFU). The general aims of the subject "*Producing and Using Instructional Tools*" are to identify several types of instructional tools (traditional and online tools), and describe their importance, their classifications, the factors of their selection, and educational uses in diverse contexts. In addition, it aims to encourage students to incorporate these tools in learning environments as they develop in their own teaching.

I taught this subject at KFU for the first time in 2008, before the commencement of this study. In that year, I was involved in the refinement of the subject's aims, topics, evaluation, development, and resources, and I engaged in revision of the materials. The subject was taught face-to-face at this time. This experience meant that I was familiar with the subject's general aims, learning outcomes, and content (see

Appendix 5). I then divided the subject into two delivery modes to create a blended and collaborative learning environment: face-to-face lectures and the opportunity to engage with online tools.

Face-to-face content

The subject began with a lecture for an hour on the Monday of each week in the fifteen weeks of the semester. Lectures were given by myself to fifteen students in one of the two computer labs in the Faculty of Education at KFU. The research process and the subject requirements were explained to the students in the first two weeks (the orientation weeks). Each student had a copy of the subject outline clarifying the subject details, study time, lecture schedule, online activity schedule, student evaluation and assessment, and the requirements of the collaborative tasks and submission rules (see Appendix 5).

Lectures covered a range of topics relating to the use of instructional tools and ICT in teaching (see Table 4.1).

Table 4.1 Topics of the lectures.

Week	Topics
1	Orientation and how to use Blackboard.
2	Orientation and how to use Blackboard.
3	- Why do we use instructional tools? - Classification of instructional tools. - What are instructional tools?
4	What are the different types of instructional tools? 1- Visual aids. 2- Audio. 3- Audio-visual.
5	Norms of instructional tools selection: 1- Validity of the content. 2- Appropriateness for the students' characteristics.
6	- Norms- continued : 3- Appropriateness for the teaching strategy. 4- Contribution to the achievement of teaching objectives.

7	- How to select an appropriate instructional tool? 1- Understand the subject goals and activities. 2- Specify the required instructional tool.
8	- How to produce an appropriate design? 1- Consistency and normality. 2- Repetition and consistency. 3- Contrast.
9	Public Holiday.
10	- Focus on definition and identity: What is educational communication?
11	- What is ICT in Education? 1- Definition. 2- The role of technology in teaching and learning. 3- Advantages of technology in Education.
12	- The relationship between ICT in Education and learning skills.
13	- Discuss examples of technology tools used in educational context. 1- Email. 2- Chat.
14	- Examples of technology tools- continued: 3- Discussion forum. 4- Mobile learning. 5- Social software.
15	- Planning to produce and design technology tools: 1- Analysis stage. 2- Strategy stage. 3- Evaluation stage.

The overall purpose of this subject is to identify the diverse types of instructional tools, including traditional tools as well as web-based instructional tools. Students were divided into five groups, and each group had three members. In order to facilitate collaborative learning, these groups were asked to discuss their collaborative tasks in both face-to-face and online learning environments.

Collaborative tasks of the subject

Students were required to complete two collaborative tasks within groups (see Appendix 3). The first collaborative task required students to plan and discuss diverse topics with peers to create a website about using technology in Education

(FrontPage software was suggested¹). This task was divided into two parts. The first part (A), required students to submit their plan of approximately 500 words using. The next part (B) required students to submit a website. The second collaborative task required students to either create a podcast about using synchronous/asynchronous tools in Education or create a video narrative about using mobile phones in Education. In this task, students had a choice to select either option one (a podcast) or option two (a video narrative). This task was also divided into two parts. The first part (A), required students to submit their plan relating to either a podcast or a video narrative using a document of approximately 500 words. The next part (B) required students to submit either an audio file or a video file.

eLearning (Blackboard)

A key component in the delivery of the subject was using online tools on the Blackboard system. The online context was designed by myself to provide students with an online learning environment that promoted collaborative learning by using purposively selected online tools to support student learning. In this environment, students were required to complete the two collaborative tasks within their groups. They were required to discuss the topics of the collaborative tasks, plan their design with their group members using the online tools, and then submit their work on the system. Blackboard was designed for this subject with the provision of four main tools. These online tools were a discussion forum, an email tool, a chat tool, and a journal tool. These are represented in Figure 4.1 and each will be described in more detail in the following sections.

Microsoft Office, 2012, FrontPage 2003, accessed, 11/1/2012, ¹

<http://office.microsoft.com/en-au/frontpage-help/>

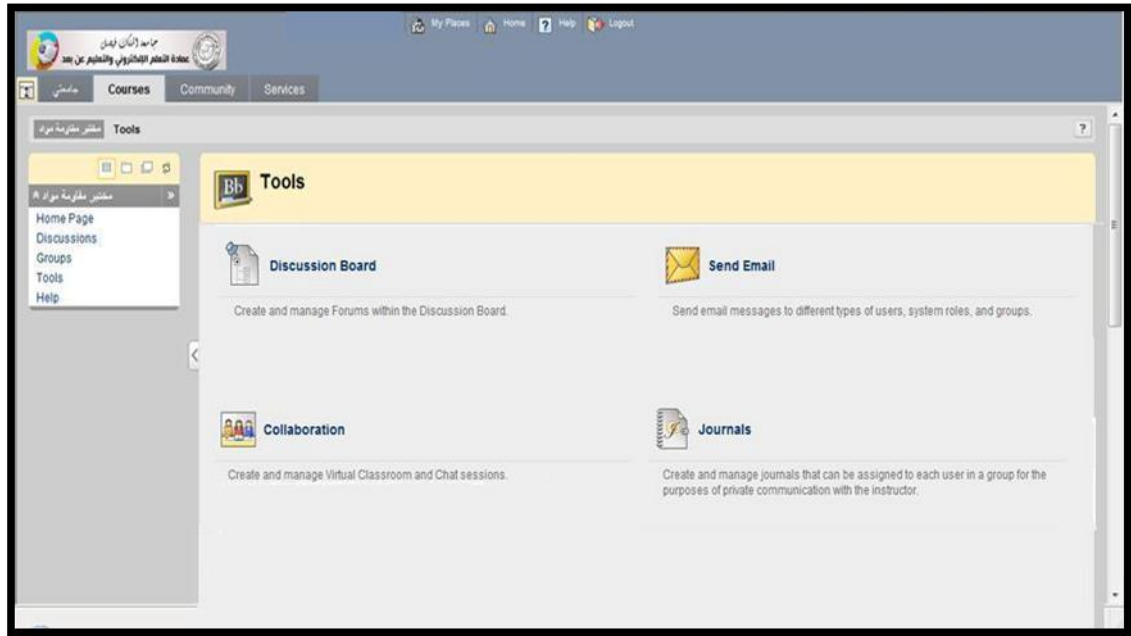


Figure 4.1- Blackboard tools.

Discussion forum

The discussion forum was designed to support asynchronous participation and interaction between students and between students and the teacher. Students were required to use this tool to participate and interact with their group members to discuss the two collaborative tasks. Each student was required to participate in a minimum of five posts with 100 words in length for each task before submission. Students were also encouraged to respond to the teacher's questions posted after the lecture each week. Figure 4.2 shows students' interactions within topics of discussion.

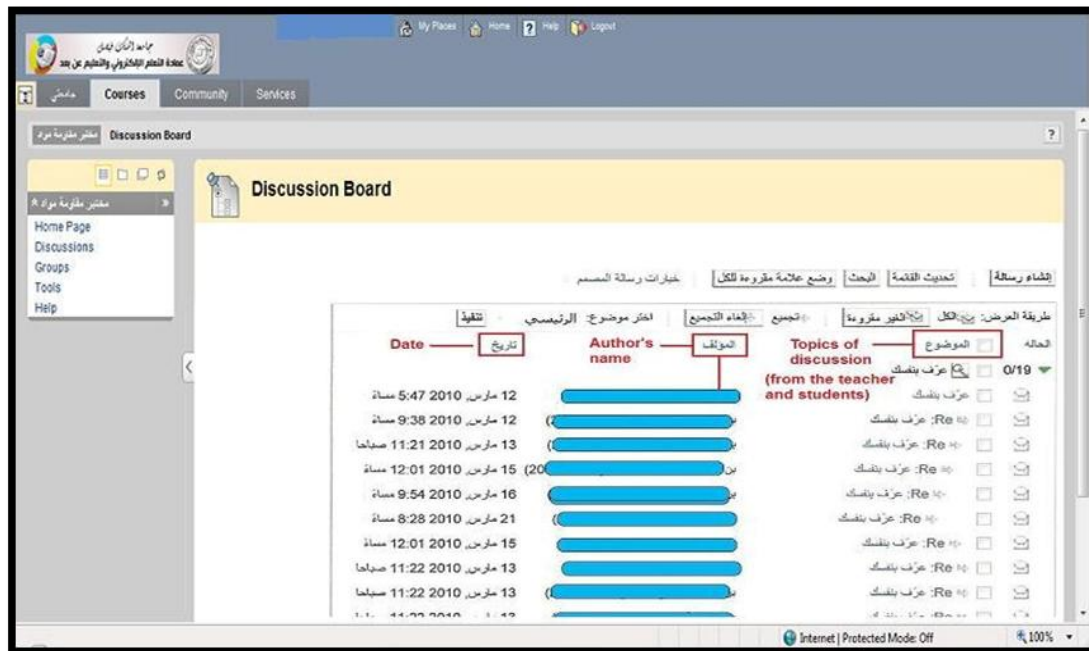


Figure 4.2- Discussion forum.

Email tool

The email tool was an optional asynchronous tool. Groups were encouraged to utilise it for relevant discussions on the collaborative tasks. Students were required to cc: the teacher on those discussions. It was also designed to allow the teacher to send announcements and reminders for all student groups, and to allow the students to contact the teacher for any question or inquiries. Figure 4.3 shows examples of students' messages to the teacher.

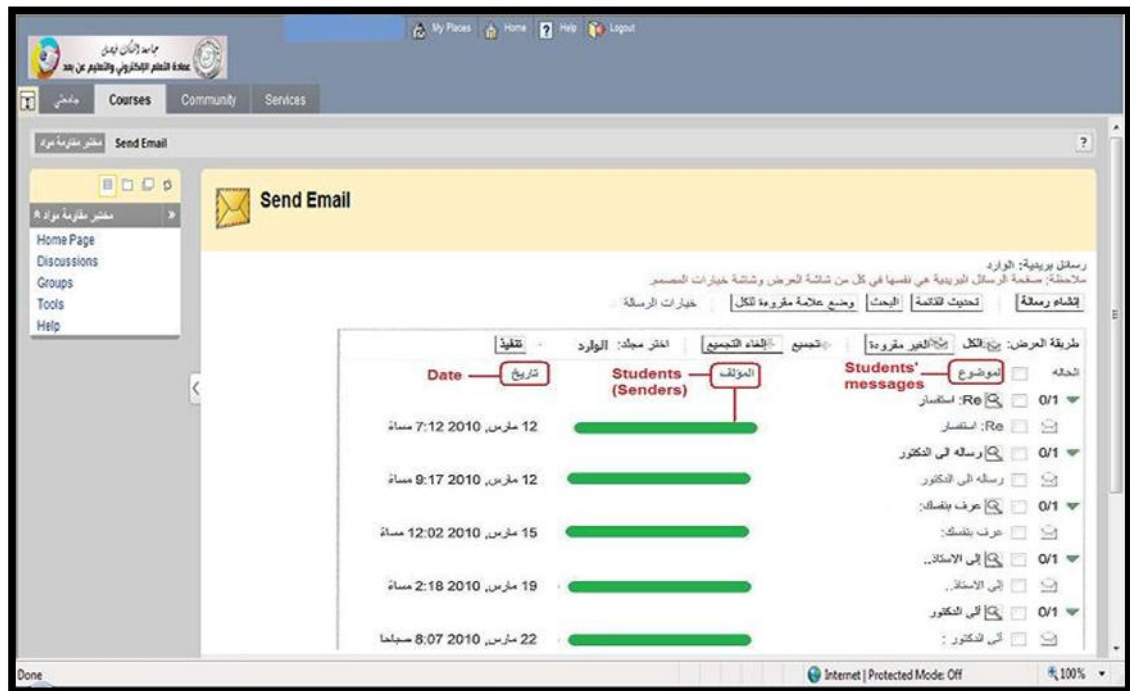


Figure 4.3- Email tool.

Chat tool

The chat tool was designed for synchronous participation and interaction amongst students and with the teacher to discuss a particular issue in the subject such as the requirements of collaborative tasks or difficulties in completing the tasks. Students were required to participate in chat sessions that were organised by the teacher for an hour out of class time each week. Additionally, students were encouraged to use it for group meetings. The transcripts were automatically archived in the system. Figure 4.4 shows discussions between students and the teacher in a chat room.

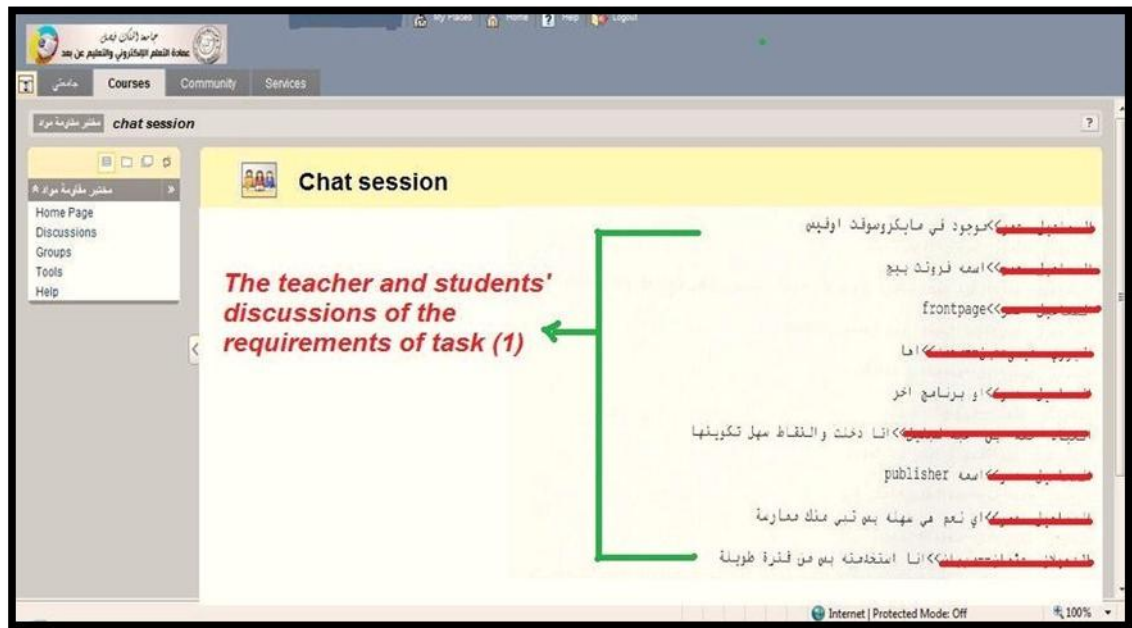


Figure 4.4- Chat tool.

Journal tool

The journal tool was designed to support student reflection on the content of the subject as well as on their own learning. Figure 4.5 shows an example of a student's reflections on the collaborative process (translated in English).

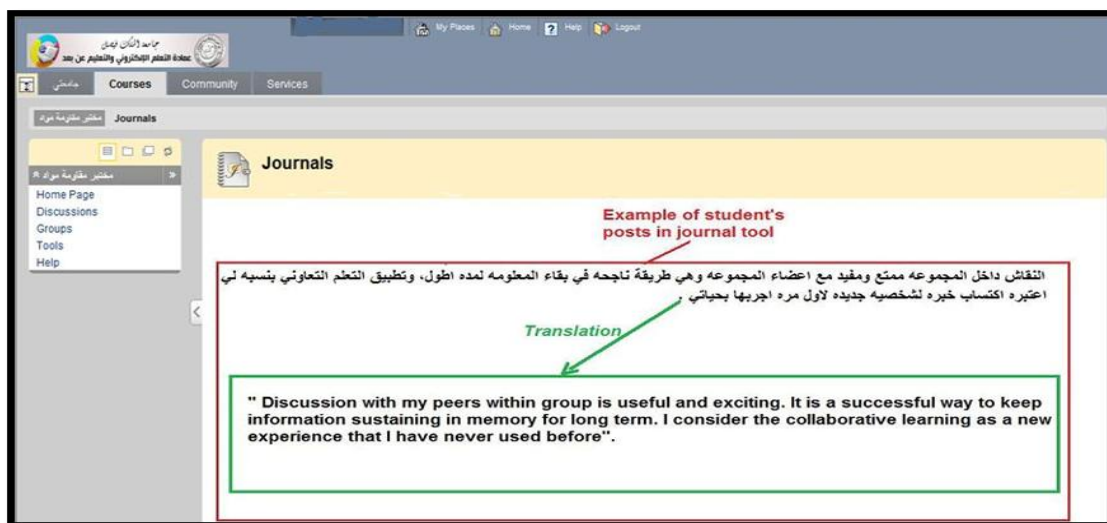


Figure 4.5- Journal tool.

Iteration 1

The student participants

The student participants in the first iteration of the study were fifteen education students in their first year who enrolled in the subject "*Producing and Using Instructional Tools*". All participants in this iteration were males aged between 18-20 years. Based on my knowledge, five student participants came from different small towns and villages around the city, and eight students came from other cities a few hundred kilometres from KFU (SPI6.3). The preliminary interview data indicated that these students travelled by car or train on a weekly basis to attend their classes at KFU (SPI6.3) (see Appendix 4). Additionally, 12 participants identified that they live in large families of 6-10 members and that their parents work in agricultural fields or run their own business (SPI6.3).

The students all identified that they had experienced face-to-face instruction in high school and at KFU (SPI6.3) (see Appendix 4). Moreover, 12 students reported using the Internet for about 10 hours a week for general browsing, checking email, participating in public discussion forums, and for maintaining personal Facebook

accounts. However, none of the students identified as having used the Internet for learning or educational purposes (SPI6.3). Six students reported that they were very motivated to participate in this study as this was a new experience for their learning, at the same time, they were worried as they had not engaged in any kind of online or collaborative learning environments (JT12.3). Meteb described his engagement as:

I am excited for the new experience of collaborative learning and the use of online tool, but I find it difficult to deal with them, especially using discussion forum for contacting with my colleagues because I have not used it before (JT12.3).

Qasem also described his experience as :

I think this is a good experience to be engaged with online learning environment, but it is hard to use the online tools, particularly at the first time (JT12.3).

Description of Iteration 1

The first iteration of this study was conducted in the first semester (February –June) of 2010 in the faculty of Education at KFU in Saudi Arabia. Before the commencement of this study, I contacted the Education Technologies Department in the Faculty of Education at KFU and asked them to provide a computer lab equipped with fifteen PCs for the subject. In addition, I had contacted the eLearning Deanship, which is concerned with all the matters of e-learning inside KFU to ensure that all electronic services were provided for the online learning environment of the study.

The first iteration included the full fifteen weeks of the regular university semester. In the first two weeks (orientation weeks), the online tools provided on Blackboard were introduced by myself to the student participants. I explained to the students how to use these tools and I also responded to the participants' questions about their new learning environment. From my observation journal, most of the students' questions were about how to answer the assignments (collaborative tasks), and how to use the

online tools to answer these questions (RJ16.4). The students thought that the subject was difficult to pass, as they did not have sufficient skills in collaboration and online learning (JT12.3, JT17.3) (see Appendix 4).

Based on my observation journal, most of the students did not use the reading resources (e.g. online readings) provided with the subject outline, and they appeared to get their information from the teacher only (RJ16.4, RJ4.6) (see Appendix 4). However, students were provided with alternative resources such as hard copies of the subject outline and references to books and online readings to attain information about the topics and lectures. In addition, the preliminary interview data indicated that 10 students preferred to discuss the course with their group members, and interacted with them when participating in group work. On the other hand, 5 students reported that they preferred not to be engaged with group work, and they tended to discuss and interact with the teacher (myself) only (SPI6.3) (see Appendix 4).

In this iteration, students were required to participate in a discussion forum in order to complete the two collaborative tasks. They were also required to participate in chat sessions, and use the email and journal tools in order to meet the subject requirements. In week 3, after the orientation weeks, student participation and interaction in the online tools added up to 54 posts (OC12.3). It was expected that few students participated and interacted with the collaborative tools because 6 participants reported that they were worried to be engaged with this new experience of learning (JT12.3). There were 29 posts from 14 students who interacted with the teacher, and there were 6 posts from 4 students who interacted with their peers in the discussion forum. These students used the discussion forum to discuss the collaborative tasks with their peers and the teacher. In addition, there were 5 participations in email tool from 3 students who interacted with the teacher only, and there were 14 posts from 11 students in the journal tool. There was no evidence of participation in the chat tool.

In week 4, there were 90 posts in the online tools. There were 11 posts from 8 students who interacted with the teacher, and there were 71 posts from 15 students who interacted with their peers in the discussion forum. There were 5 posts from 4 students who interacted with the teacher only in the email tool, and there were 3 posts from 3 students in the journal tool. In addition, 6 students participated in the chat tool (OC17.3). I attempted to encourage the students to participate in the collaborative tools provided on Blackboard by posting a question in the discussion forum every week regarding the topic to help students think about the way to discuss their tasks. I also responded weekly to the students postings in the discussion forum to support those who participated and to encourage others.

In the following weeks, it was expected that participation will increase after my encouragement. However, in week 5, participation decreased to 39 posts (OC26.3). There were 8 posts from 6 students who interacted with the teacher, and there were 23 posts from 5 students who interacted with their peers in the discussion forum. There were 2 messages from 2 students who interacted with the teacher only in the email tool, and there were 6 posts from 6 students in the journal tool, which reflected on the learning environments. Furthermore, there were only 7 students who participated in the chat session which was organised on Blackboard for an hour out of class time, and the chat time was suitable with most participants (OC26.3). The reason for the low number of participants was that some of students did not have their own computers or laptops, and it also was difficult for them to get back to the university to use the computer lab (SPI6.3, SII10.4) (see Appendix 4).

Although the due date of part (B) of the first collaborative task was in week 8, it was expected that the participation in the collaborative tools would decrease in the mid-session exam weeks (week 7 and week 8). For example, in week 7, there were 21 posts (OC9.4). There were 14 posts from 14 students who interacted with their peers only in the discussion forum, and there were 7 posts from 7 students in the journal tool. There was only 1 student who participated in the chat tool. However, there was no participation in the email tool. Similarly, in week 8, there were just 24 posts

(OC16.4). There were 15 posts from 3 students who interacted with their peers only in the discussion forum, and there were 3 messages from 3 students who interacted with the teacher only in the email tool. In addition, there were 6 posts from 6 students in the journal tool, and there was no participation in the chat session. In week 9, there was no participation in the online tools as it was public holiday (OC23.4).

In the last five weeks of the semester, it was expected that participation would increase, as the students were familiar with the collaborative tools. The number of student interactions only increased in the discussion forum. For example, in week 11, there were 49 posts (OC7.5). There were 9 posts from 9 students who interacted with the teacher, and there were 37 posts from 9 students who interacted with their peers in the discussion forum. There were only 3 posts from 3 students in the journal tool. However, there was no participation in the email tool or chat tool.

Generally, students described that the content of the subject and collaborative tasks was useful for them as they transferred all the information they had to practical applications such as voice and video files. The second and post interviews data indicated that 4 students considered the requirement of 500 words for each collaborative task was restrictive in completing tasks, but this became easier with group work (SII10.4, SPOI29.5) (see Appendix 4). 10 students preferred to participate in the discussion forum tool over other tools, as it is an asynchronous tool where the students can review other responses at any time and respond to each other at any time. On the other hand, 3 students considered the chat tool as inappropriate, which caused a lack of interaction. It was a great opportunity for some students to share knowledge and to build new intimate relationships between group members. However, little interaction was amongst other groups because of the absence of harmony. From the second and post interviews data, there were some aspects that affected student interaction within their collaborative online learning, such as poor air conditioning in computer lab, difficulties with Internet connections during classes,

lack of Internet connection at some students' homes, and a lack of personal computers or laptops for some students (SII10.4, SPOI29.5) (see Appendix 4).

Researcher's reflections

The blended learning environment used within the first iteration of this study appeared to provide a significant opportunity for the student participants to use technology and collaborate within their learning contexts. The online collaborative tasks allowed students to share knowledge and work in groups. This helped students guide each other in their utilisation of the computer and Internet. Student feedback (journal tool) and their interactions in the online tools (synchronous and asynchronous) during the iterative cycle allowed me to understand and analyse the student collaborative learning environment and its limitations. Overall, the online observation data showed that there was a lack of interaction in the online tools, especially email and chat tools. For instance, six students did not use the email tool for interaction, either with their peers or the teacher. In addition, 5 students did not participate in any chat session during the iteration. These frequencies and the student data (SPI63, SII10.4, SPOI29.5) guided me to discover apparent problems within the first iteration, such as difficulties in interaction within groups, difficulties in the content of collaborative tasks, and difficulties in the use of online tools. This led me to refine and redesign the second iteration of this study.

As I was involved in this blended learning environment as a teacher, it could be said that this study is likely to produce understandings of: the implications of using technology in a higher education context in Saudi Arabia; the important role of Computer-Supported Collaborative Learning (CSCL) to help teachers improve their teaching strategies and help students develop their learning skills; the cultural issues that may influence collaborative learning of higher education students in a blended learning environment. There were some challenges that might restrict the implementation of a blended learning environment in this study, such as managing and designing the complexity of the educational context, managing roles and

responsibilities, creating a useful learning experience and meeting students' expectations.

Iteration 2

Redesign of the second iteration

The subject "*Producing and Using Instructional Tools*" was also taught by myself to the student participants for the second iteration of this study, and a similar blended learning environment was created to enhance collaborative learning amongst the participants. The second iteration of this study was refined and redesigned based on the primary analysis of students' responses and feedback from the online tools (discussion forum, email tool, chat tool and journal tool) provided on the Blackboard system. This analysis revealed a number of problems in the first iteration, such as a lack of interaction amongst members within their groups, difficulties in the content of the collaborative tasks and lack of the use of online tools.

First, the results of the first iteration showed that there was little interaction between members within two groups. Frequency of participation in the discussion forum showed that there were only 10 posts from 4 students (from two groups) who interacted with their group members. Additionally, these 4 students identified that they faced difficulties in interaction within their groups due to the absence of harmony between the members (SII10.4, SPOI29.5). To solve this problem, I asked the student participants to group themselves in three in the orientation weeks of the second iteration, before the commencement of the study, to enhance harmony between group members.

Second, the student data (observations and interviews) from the first iteration showed that there were difficulties in completing the collaborative tasks because of their complexity. For example, 4 students identified that the content of the tasks was difficult. They reported that the requirement of 500 words for each task could be a

barrier in completing the tasks (SII10.4, SPOI29.5). To solve this problem, I posted (three-four) key questions (e.g. Why?, How?, When?) on a weekly basis in the discussion forum to help the students to deeply think about the topic and enable them to determine the key elements of the task.

Third, the frequency of participation in the online tools in the first iteration showed that there was a lack of use of the online tools. Overall, 6 students did not utilise the email tool for interaction, either with their peers or the teacher. Furthermore, 5 students did not participate in any chat session during the iteration. To solve this problem, I explained to the students how to use the online tools in more detail in the orientation weeks before the second iteration. I also encouraged the participants to introduce themselves in the discussion forum during these weeks so as to be familiar with the online environment. Within the second iteration, a weekly reminder was sent to the students' emails on Blackboard to encourage students in using this tool for interaction. In addition, each student was required to participate in 5 chat sessions at minimum to support synchronous interactions for collaborative learning. These solutions addressed the redesign of the second iteration as summarised in Table 4.2

Table 4.2 Solutions to address the redesign of Iteration 2.

Problems of Iteration 1	Evidence (results from Iteration 1)	Solutions
1. Lack of interaction amongst members within their groups.	<p>1. From the online observation data, four students participated in ten posts only in discussion forum (these students were members of two groups).</p> <p>2. From the interviews data, these students reported that they experienced difficulties in interaction into their groups (SII10.4, SPOI29.5).</p>	In this iteration, students were required to group themselves of three members in the orientation weeks.

2. Difficulties in the content of the collaborative tasks.	From the interviews data, four students identified that the content of the tasks was difficult and the requirement of 500 words of the task was a limitation (SII10.4, SPOI29.5).	In this iteration, the researcher posted key questions weekly in discussion forum to help the students think about the way of discussion and to find the elements of the task.
3. Lack of the use of online tools.	From the online observation data, six students did not use the email tool for interaction, and five students did not participate in any chat session in the iteration.	<p>1. The use of online tools was explained to the participants in more details in the orientation weeks.</p> <p>2. Students were encouraged to introduce themselves in discussion forum in the orientation weeks to increase the sense of familiarity with the online environment before the commencement of the study.</p> <p>3. A message was sent weekly to the students' emails on Blackboard to remind them using this tool for their discussions.</p> <p>4. Students were required to participate in five chat sessions in minimum for their collaborative learning.</p>

The student participants

The student participants of the second iteration in this study were a new cohort of fifteen education students who enrolled in the core subject *"Producing and Using Instructional Tools"* in a first year course in the Education Technologies Department

of the Faculty of Education at KFU. From the preliminary interview data, the participants' backgrounds in this iteration were similar to the participants' backgrounds of the first iteration of this study (SPI4.10). In this iteration, ten students came from several towns and villages around the city (SPI4.10). They identified that they live in large families of more than five members, and their parents have a low level of education and work in agricultural fields or run their own business (SPI4.10) (see Appendix 4).

Based on the preliminary interview data, all participants identified that they experienced face-to-face delivery in high school and in previous experiences at the KFU (SPI4.10). Ten students identified that they used the Internet for about 10 hours a week for checking email, participating in public discussion forums, and maintaining personal Facebook accounts. However, only one student identified that he had used the Internet for about 3 hours a week for only visiting the KFU website for learning or educational purposes (SPI4.10). In addition, 13 students reported that they have computers and Internet access at home (SPI4.10). All student participants reported that they were very enthusiastic to participate in this study, especially to be involved in collaborative learning environments (JT1.10). One participant expressed, "Collaborative learning is a useful strategy because I think that I will learn new skills and gain new and useful information from my colleagues in the group" (Basem, JT1.10). Another student stated "It is a great opportunity to be engaged with group work because we need to know how to learn from each other" (Khalil, JT1.10) (see Appendix 4).

Description of Iteration 2

The second iteration of this study was conducted in the second semester (September-January) of 2010 in the Faculty of Education at KFU in Saudi Arabia. I contacted the Education Technologies Department and the eLearning Deanship at KFU and asked them to provide a computer lab equipped with fifteen PCs and to arrange all

electronic services for the study before the commencement of the iteration, as I did for the first iteration.

The second iteration of this study occurred through the fifteen weeks of the regular semester at KFU. In the first two weeks (orientation weeks), I introduced the new learning environment to the student participants and explained to them how to use the online tools provided on the Blackboard system. In addition, students were provided with the opportunity to have their questions answered about their new learning environment. During the orientation weeks, students were encouraged to introduce themselves in the discussion forum provided on Blackboard. Only one student participated in this task in the second week (OC8.10) (see Appendix 4).

Students were required to complete the similar collaborative tasks within groups, as the students had done in the first iteration (see Appendix 3). The first task required students to create a website about using technology in Education. The second task required students to either create a podcast about using synchronous/asynchronous tools in Education, or create a video narrative about using mobile phones in Education. Groups were required to discuss their tasks with their group members in the discussion forum, with a minimum of five posts for each member. They were also required to use the chat tool with the teacher and with their peers for an hour each week. Each student was required to participate in a minimum of five chat sessions. Furthermore, those students were required to utilise the journal tool to reflect on their learning after class each week, and to use email tool to communicate with each other and to contact the teacher if they have questions about the subject.

In week 3, the online observation data showed that most student interactions were in the discussion forum (OC15.10). It was expected that the students participated in the online tools as they reported that they were enthusiastic to be involved in this learning environment (JT15.10). There were 18 posts from 10 students who interacted with the teacher only in the discussion forum, and there were 5 posts from 5 students who reflected on their learning in the journal tool. However, there was no

participation in email or chat tools (OC15.10) (see Appendix 4). I attempted to support students to participate in the collaborative learning environment and interact with groups via the online tools. I posted key questions in the discussion forum for the groups to discuss and I sent reminders to their emails on Blackboard to encourage them to interact with their peers via the tools. I also increased my responses to the students' posts in the discussion forum to support their interactions. After this encouragement, it was expected that the number of student interactions with their group members would increase in the following weeks.

In week 4, there were 11 posts from 2 students who interacted with their peers, and there were 7 posts from 6 students who interacted with the teacher in the discussion forum. In addition, there were 11 posts from 9 students in the journal tool, and there were 9 students who participated in the chat session organised by the teacher. However, there was no participation in the email tool (OC22.10). Following this, in week 5, there were 29 posts from 8 students who interacted with their peers, and there were 3 posts from 3 students who interacted with the teacher in the discussion forum. There were 9 posts from 8 students reflecting on their learning in the journal tool, and there were 7 students who participated in the chat session. However, there was no participation in the email tool (OC29.10). As there was no participation in the email tool during the first five weeks, I sent a message to the students' emails on Blackboard every week (from week 6 to week 15) to remind them that it is important to use email as an asynchronous tool for their discussions, and to contact the teacher if necessary.

Although the due date of part (B) of the first task was in week 10, it was expected that the number of student posts would decrease in the holiday weeks and mid-session exam weeks. For example, there was no participation in week 8 and week 9 because of mid-session break and a public holiday (OC19.11, OC26.11). In addition, in week 10, student interaction decreased due to mid-session exams. There were 4 posts from 4 students who interacted with the teacher only in the discussion forum. There was only 1 message from a student who interacted with his group members,

and there was another message from the same student to the teacher in the email tool. Furthermore, there were 6 posts from 6 students in the journal tool, and there were 5 students who participated in chat tool (OC3.12).

After encouraging the students and also students' familiarity with the collaborative tools, I anticipated that interaction would increase, especially in the last five weeks of the semester. In week 13, there were 12 posts from 8 students who interacted with the teacher, and there were 41 posts from 8 students who interacted with their peers in the discussion forum to discuss the collaborative tasks. There were 2 posts from 2 students who interacted with the teacher only in the email tool. Moreover, there were 9 posts from 9 students who participated in the journal tool, and 6 students participated in the chat tool (OC24.12) (see Appendix 4).

Researcher's reflections

The second iteration of this study seemed to provide the student participants with meaningful opportunities in using technology and collaboration within their learning contexts in a blended learning environment. The redesign of the second iteration and the students' enthusiasm to participate in the learning environment enabled me to reinforce students' confidence and develop their autonomous learning skills in convenient and flexible learning environments. This was obvious amongst the group members as they positively responded to encouragement to interact with each other via the synchronous and asynchronous tools. Overall, the online observational data from participation in the discussion forum revealed 118 posts interacting with the teacher, and 181 posts interacting with group members. The journal tool revealed 107 posts from the students reflecting on their own learning and on the learning environment. Ten students did not use the email tool at all. Because of technical difficulties, only two students satisfied the requirement of five posts in the chat tool, and one student did not participate in any chat sessions in the iteration.

Additionally, there was an apparent harmony amongst the group members, particularly when they worked together to share knowledge and discuss their collaborative tasks via the online tools (RJ12.11, RJ7.1). From the student data (observations and interviews), most students identified that they felt comfortable within their groups, and that this helped them to complete their tasks (SPO13.1). One student described " It is convenience to be into this group as my colleagues are very helpful. I think that we will complete our tasks on due date" (Talal, JT15.10). In this iteration, technical problems such as difficulties with an Internet connection, slow Internet speeds, difficulties in accessing KFU's website, and difficulties in accessing the chat tool on the Blackboard system were common factors that influenced student interactions within their collaborative online learning environments. In order to answer the research questions, analysis of the results of the iterations helps to understand student interaction with the support of collaborative tools provided for the learning environment, and allows to determine what enabled or inhibited the interactions, such as cultural/social and technological factors.

Summary

In this chapter, the subject taught to the student participants in the two iterations of this study was described. This description included the blended learning environment (face-to-face context and online learning environment) with a focus on the online tools used on Blackboard. Each iteration of this study was explained. The student participants' backgrounds as well as their learning experiences collected within the iterations were also described. My reflections of the iterations with connection to the redesign of the second iteration of the study were identified.

The next chapter reports on the findings from the students' responses in the online tools. It also reports on findings about their cultural and social backgrounds, which were collected through observations and interviews in the first iteration.

Chapter 5

Findings: Iteration 1

Group and task backgrounds

The participants of this study were fifteen education students in a first year IT class at King Faisal University (KFU) in Saudi Arabia. Those students were randomly divided into five groups. Each group had three students. Those groups were required to complete two collaborative tasks within their groups (see Appendix 3). The first collaborative task required students to plan and discuss diverse topics with peers to create a website about using technology in Education. In this task, the students were required to submit their plan of 500 words, and then to submit their final product as a website. The duration of this task was five weeks. The second collaborative task required students to create a podcast about using synchronous/asynchronous tools in Education, or a video narrative about using mobile phones in Education. In this task, the students were required to submit their plan of 500 words, and then to submit their final product using either an audio file or a video file. The duration of this task was four weeks. In order to support these tasks, the students were engaged in face-to-face lectures covering the topics relevant to the use of technology tools and ICT in teaching, and were involved in an online learning environment for two hours of class time each week over fifteen weeks of the semester. Additionally, two hours per week of independent study was expected.

The research is framed and guided by the following questions:

- *How can collaborative tools support students' learning in a higher education technology subject in Saudi Arabia?*
- *What are the contextual and cultural factors that support or inhibit students' learning in a blended learning course in Saudi Arabia?*

In order to respond to the research questions, students were observed and interviewed (preliminary, second and post interviews) over fifteen weeks of the semester to examine their interactions in the online learning context while completing the two collaborative tasks, and to explore cultural and social backgrounds, students' beliefs regarding technology, students' personal factors that affect the use of technology, and to investigate difficulties that students have confronted within their use of technology and collaboration. The findings from the students' cultural and social backgrounds, discussion forum, group posts, and communications from other tools in Blackboard such as email, chat, and journal are presented in this chapter.

Each group's response to the tasks is examined along with the social, cultural, and technical factors

Iteration 1

Group A/Task 1

Students' backgrounds

This group had three members (Haytham, Zaki & Qasem) in their first year who were enrolled in the subject *"Producing and Using Instructional Tools"* in the Faculty of Education at KFU. The preliminary interviews were conducted to explore their cultural and social backgrounds, their beliefs, and personal factors that affect their use of technology and collaboration. The findings indicated that these group members came from other cities a few hundred kilometres from KFU, and they travelled by car or train to attend their classes (SPI6.3). In addition, they reported that they live in large families of six to ten members, and their parents have low levels of education (SPI6.3). Haytham's father works in agricultural fields. Zaki and Qasem reported that their parents run their own business (SPI6.3).

These group members had experienced face-to-face instruction in high school and at KFUPU (SPI6.3). Haytham and Qasem reported that they have their own PCs and Internet access at home. They reported using the Internet for about ten hours a week for general browsing, checking emails, participating in public discussion forums and maintaining personal Facebook accounts. However, Zaki reported that he has no PC or Internet access at home. He reported using the Internet for only three hours a week for checking email and participating in discussion forums (SPI6.3). None of these group members reported having used the Internet for learning or educational purposes (SPI6.3).

1. Discussion forum

Students' interaction

The discussion forum was designed to allow asynchronous interactions between students and between students and the teacher in the online learning environment. Students were required to utilise this tool to interact with their group members in order to discuss the two collaborative tasks. In this group, the three members used the online discussions using this tool to complete Task 1. The online discussions of this group are coded based on the group members' collaboration at the sentence level (task definition, task process, confirmation, suggestion and disagreement) from week 3 to week 7. These codes clarify the decision functions of the group and allow to see how they reached their final decision in order to finalise the task (creation of a website). Table 5.1 shows the frequencies of these codes derived from the group interactions in the discussion forum.

Table 5.1 Frequencies of the codes based on the group members interactions.

Week	Student	Codes	Frequency 'N'
4	Haytham	Task definition Task process Suggestion Confirmation "agreement" Disagreement	1 3 0 1 0
4	Zaki	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 1 1 1 0
4	Qasem	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 0 1 1 0
5	Haytham	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 0 1 1 0
5	Zaki	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 2 0 1 1
5	Qasem	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 0 1 0 0
7	Haytham	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 0 0 0 0
7	Zaki	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 0 0 1 0
7	Qasem	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 1 1 0 0

Note.

1. Task definition: Relates to the way of how the group members understand the task and identify the topic.
2. Task process: Relates to how the group members keep the group on track.
3. Suggestion: Relates to how the group members suggest alternatives and solutions to develop the task.
4. Confirmation "agreement": Relates to the statements include "Yes" or "agree", or consist of any agreement in any other way.

Based on online observations, task definition only occurred once in the online discussions in week 7 (OC17.3). For example, Haytham defined technology and how this can be used in Education. He stated:

Technology is a combination of tools that can be used to support the learning process. This kind of support involves all aspects of planning, preparation, implementation and evaluation in order to achieve the goals of Education (CT1A17.3).

Disagreement also occurred once in the online discussions (OC26.3). In this instance, Zaki disagreed with Haytham's suggestion to focus on the important role of the teacher for their product. Haytham stated "I suggest to focus on the teacher as he/she plays the important role to accomplish the learning goals and to meet the student needs" (CT1A26.3). Zaki replied "I disagreed with Haytham's suggestion. Our focus should be for both teacher and students because they are both involved in the learning process" (CT1A26.3).

Discussion about task process appeared to be the most frequent activity (n=7, over five weeks), followed by confirmation or an agreement statement (n=6, over five weeks). These group members tended to orient the group to the task process by focusing on the reasons for using technology, providing information about the term of technology in Education, and listing examples of technology tools in Education. This occurred seven times in three weeks (OC17.3, OC26.3, OC9.4). For example, Zaki provided information about the term of technology in Education. He stated:

It is known that both the teacher and the learner are the main elements of the learning process. The intermediary is usually available in the learning context to facilitate the communication between the two elements. This intermediary could be one of the technology tools such as computer or video (CT1A17.3).

Haytham attempted to orient his group by this question "Why should we use Internet for learning?" (CT1A17.3) and then, he encouraged his peers to focus on the reasons for using technology, especially for teachers at tertiary level. He stated "One important reason for using technology is to improve teaching methods, especially at university" (CT1A17.3). Confirmation occurred six times in three weeks (OC17.3, OC26.3, OC9.4) as suggestions or task processes were agreed upon. For example, there was confirmation to stress on the definition of technology in Education. Qasem stated, "I agree with Haytham's statement to stress on definition of technology in Education" (CT1A17.3). To focus on the Internet as an example, Haytham stated "I agree with Qasem's concept to focus on the Internet as an example" (CT1A26.3). To include implication of using technology in Education as an example, Haytham stated "I agree with you guys to include implication of using technology in Education" (CT1A9.4).

Suggestions including the communications between teachers and students, advantages of the use of technology in Education, implications of using technology in Education, and examples of technology tools in Education were the least frequent activities and recorded only five times in three weeks (OC17.3, OC26.3, OC9.4). They were used to develop the task process for the final product (CT1A17.3, CT1A26.3, CT1A9.4). For example, Qasem suggested including the advantages of using technology tools in Education. He stated:

One of the advantages of using technology tools in Education is that the role of teacher in helping students to acquire self-education skill. Additionally, the variety of technology tools in the learning environment increases the students' motivation to learning (CT1A17.3).

Zaki suggested alternative to his peers by focusing on the communication between teacher and students. He stated "We should consider the relationship between teacher and students based on the social theories of learning" (CT1A17.3).

Group's final product

In order to complete the final product, this group was required to submit a plan of 500 words in week 6, and to submit a website platform in week 8 based on the group members' online discussions. Each member was required to participate in five postings (of at least 100 words) to discuss the task.

These group members submitted 670 words in the Bb system on the due date (week 6). They organised their plan based on the topics they discussed in the discussion forum. They planned to define eLearning as the main topic of their final product (website) alongside other topics discussed in the discussion forum such as the definition of technology in Education, implications of using technology in Education, examples of using technology in Education, and reasons for using the Internet in Education.

This group submitted their website in the Bb system on the due date (week 8). Their website included only two topics, which were an overview of technology in Education and eLearning. However, those students discussed four topics in the discussion forum (CT1B16.4). This means that the group members' work was not directly reflected in their final product. In their website, the members described the importance of the use of technology in Education, and the role of the teacher who uses technology in the classroom to support students in meeting their educational needs. They focused on the teacher as the primary beneficiary of the use of technology in the learning process. They also described eLearning as a significant resource of information, which can be used as an intermediary to facilitate learning and communication between the teacher and students.

In addition, eLearning did not appear to be the main topic of this group's website because of the overlap of information between the definition of technology in Education and eLearning as well as lack of organisation. This group also focused on email as an example of eLearning. However, these members suggested and discussed more than one example of using technology in Education. Therefore, this group received an average mark due to the lack of relation of their website's content to their online discussions.

Social/Cultural Issues

This section describes the social/cultural matters that can be derived via the discussion forum from the students' collaboration. In this group, the students' interactions revealed a number of social/cultural indicators, such as individual roles and participation levels through the members' responses to completing Task 1. Individual roles of the group members were not clearly defined. They shared roles and supported each other by providing information to keep the group on track and suggesting alternatives to developing the task. For example, the students all contributed to developing a rationale of using technology, explaining the term of technology in Education, and reviewing examples of technology tools in Education. In this instance, Haytham stated:

One important reasons for using technology is to improve teaching method, especially at university. This will lead students to understand the subject and interact with the materials. It also encourages students to interact with each other in the classroom (CT1A17.3).

These group members also described the relationship between teachers and students, advantages of the use of technology in Education, implications of the use of technology in Education, and applications of technology tools in Education. For example, Zaki stated:

We should consider the relationship between teacher and students based on the social theories of learning. This means that the teacher has the responsibilities to provide students with appropriate learning environments that help them build knowledge, and gain new skills and experiences (CT1A17.3).

This group had relatively equal participation levels. Two members attempted to steer the group to the task process, and they suggested one alternative to developing the task. For example, Haytham encouraged his peers to focus on the reasons for using technology, particularly the Internet. He posted the question "Why should we use the Internet for learning?" (CT1A17.3). Following this, he stated:

Using the Internet in Education can eliminate the boredom of traditional learning, increase the positive interactions between students and the teacher, and provide a large amount of information in a short time (CT1A17.3).

He also attempted to develop the task by suggesting to include implications on the teacher, as they play an important role in students achieving the learning goals. One member then steered the group to the task process with his suggestion of three alternatives to developing the task. For example, Qasem asked his peers to think carefully about the topic before selecting it for their website. He suggested they include implications of using technology in Education and an application of technology tools in Education. From this guidance, eLearning was incorporated as a topic of the group's website.

Students' interaction with the teacher

The students were encouraged to respond to the teacher's questions which were posted in the discussion forum after the lecture each week. The questions were relevant to the lectures and covered a range of topics of technology tools and ICT in teaching. They were provided to help the students think about the topic of Task 1. These questions were:

- What do you know about technology in Education?

- What are technology tools?
- Why do we use technology tools?
- What are the norms of technology tools selection?

The teacher encouraged the students to respond to the questions during their interactions with each other. These group members posted ten responses in the discussion forum in response to these questions (OC12.3, OC17.3, OC26.3, OC2.4, OC9.4). There were two posts from two students to respond to the first question "What do you know about technology in Education?". Students attempted to interact with the question in different ways. For example, Haytham provided four definitions of technology in Education in one post. He stated:

The term of technology in Education can be defined in four ways:

- It is a teaching approach that helps the teacher transfer knowledge and ideas... This supports teaching approach.
- It is the teacher's ability to use different types of technology tools during the period of teaching... This supports teachers.
- It is the student's ability to understand the content through the use of technology... This support students.
- It is the ability of the content to be modified from time to time based on the technology development... This supports the subject content (DT17.3).

These definitions did not emerge in the group's final product or in the group discussions in any way. In addition, these two members responded to the second question "What are technology tools?". For example, one member described the different types of technology tools as visual, audio, and audio-visual tools (DT17.3). Another student described technology tools that can be used to enhance teachers' and students' skills (DT17.3). Two members responded to the question "Why do we use technology tools?". One student stated that "technology tools break the barriers between the teacher and students and motivate the students to learn more" (DT2.4). Another student reported that the use of technology tools supports the learning process through the involvement of the student and not to rely on the teacher as in the traditional methods (DT2.4). These students also responded to the question "What are the norms of technology tools selection?". They reported that technology

tools are selected based on the teacher's ability to consider the individual students differences as well as their learning needs (DT2.4). It was expected that the questions posted will help students understand the issues related to technology in Education, and help them to focus on specific topics of the group's final product through their interaction with the teacher. Thus, the members could link their responses to the content of their final product. However, it seemed that this group did not employ this interaction to produce the final task.

2. Email tool

Students' interaction with others and with the teacher

The email tool was designed to support student learning and was an optional asynchronous tool to be used for relevant discussion on the collaborative tasks. It was also provided to allow group members to contact the teacher for any questions or inquiries. None of these group members used the email tool for Task 1, or to communicate with each other or the teacher (ET12.3, ET17.3, ET26.3, ET2.4, ET9.4).

3. Chat tool

Students' interaction with others and with the teacher

The chat tool was designed to promote student collaborative learning. It was provided for synchronous interactions between students and with the teacher to discuss the requirements or difficulties with the collaborative tasks. Group members were required to participate in the chat sessions organised by the teacher for an hour each week. They were also encouraged to use this tool for group meetings. There were five chat sessions that were set by the teacher over five weeks (from week 3 to week 7) to discuss the requirements of Task 1. The chat tool transcripts show that

none of these group members used this tool for interaction with each other or the teacher (CT12.3, CT17.3, CT26.3, CT2.4, CT9.4).

4. Journal tool

Students' interaction with others and with the teacher

The journal tool was designed to support student learning and was intended to enable the students to reflect on the content of the subject and their own learning. In this group, the three members used this tool to reflect on their own interactions and collaborative learning within their groups through their completion of Task 1 (OC12.3, OC2.4, OC9.4). For example, one member reported that "the variety of collaborative tools increase the number of opportunities of interaction between the members" and then, he confirmed "we need these opportunities to complete our work" (Zaki, JT12.3). In addition, two members reflected on the limitations of Task 1 in two posts. For example, one member reported that the requirement of 500 words for the task limited the group work to complete the task (Zaki, JT2.4). Another member reported that difficulties with Internet access in the computer lab was the most significant limitation in completing Task 1 (Qasem, JT9.4). These limitations could impact on their overall interaction and on their final product.

Technical issues/contextual factors

Students' interactions indicated issues including technical or contextual factors that could support or inhibit the use of technology and collaboration. In this group, Qasem reported that the lack of Internet access in the computer lab was a factor that limited completing Task 1 (JT9.4, SII10.4). Additionally, Zaki reported that the requirement of 500 words for the task was a kind of restriction in completing the task. He stated "this requirement is not compatible with the given time duration. This is not sufficient to prepare a written plan of this length". (JT2.4, SII10.4).

Summary

All three members used the discussion forum and met the requirements of the task (five postings with 100 words in length for each post). This group had relatively equal participation levels between the members as they attempted to steer the group to the task process and suggested alternatives in developing the task. In addition, individual roles were not clearly defined as the group members supported each other to complete the task. The results indicated that only two members interacted with the teacher and responded to the questions posted for the task. None of these group members used the email and chat tools.

Although this group received an average evaluation mark due to the lack of relation of the product content to the online discussions content, the group's collaboration was successful overall because these group members met the requirements of the task and their reflections on their own learning were generally satisfactory (JT12.3). It was expected that these group members would participate and collaborate more. They only interacted in three weeks out of five. This could refer to the limitations that these students reported, such as a lack of Internet access in the computer lab and the 500 words restriction for the task.

Group A/Task 2

1. Discussion forum

Students' interaction

The students' discussions are coded at the sentence level to (task definition, task process, confirmation and suggestion) from week 8 to week 11. These codes clarify the decision functions that the group took to reach the final decision to complete the task (creation of audio or video files). Table 5.2 shows the frequencies of these codes derived from the group interactions in the discussion forum.

Table 5.2 Frequencies of the codes based on the group members interactions.

Week	Student	Codes	Frequency 'N'
10	Haytham	Task definition	0
		Task process	0
		Suggestion	0
		Confirmation "agreement"	0
10	Zaki	Task definition	1
		Task process	1
		Suggestion	1
		Confirmation "agreement"	0
10	Qasem	Task definition	0
		Task process	2
		Suggestion	0
		Confirmation "agreement"	1
11	Haytham	Task definition	0
		Task process	0
		Suggestion	1
		Confirmation "agreement"	1
11	Zaki	Task definition	0
		Task process	0
		Suggestion	0
		Confirmation "agreement"	0
11	Qasem	Task definition	0
		Task process	0
		Suggestion	0
		Confirmation "agreement"	0

Note.

1. Task definition: Relates to the way of how the group members understand the task and identify the topic.
2. Task process: Relates to how the group members keep the group on track.
3. Suggestion: Relates to how the group members suggest alternatives and solutions to develop the task.
4. Confirmation "agreement": Relates to the statements include "Yes" or "agree", or consist of any agreement in any other way.

From online observations, this task was defined only once by one student in week 10 (OC30.4). In this example, Zaki defined Facebook and its applications as a topic for the group. He stated:

I think Facebook is an important tool for connecting people and it is a good choice for our work. It is a social website that allows users to join several sub-networks carrying pictures and information for members (CT2A30.4).

Discussion about task process appeared to be the most frequent activity (n=3, over four weeks). The group members attempted to steer the group to the task process by focusing on specific topics, or they elaborated meaning and provided additional information (e.g. Selection of Facebook, definition of Facebook and the reasons for using Facebook). This occurred three times in one week (OC30.4). For example, Zaki tended to direct his group to select Facebook as a topic for their podcast. He stated:

Recently, Facebook is one of the best of social website. It is a tool that supports a lot of services such as uploading pictures and video clips, and news..... etc, so why do not we choose it? (CT2A30.4).

Qasem responded to Zaki's statement. He provided another definition of Facebook to support his peer's idea and to keep the group on track. He stated "Facebook is a social networking website that can connect people together from different places at different times or could be at the same time" (CT2A30.4).

Suggestions including the advantages and disadvantages of Facebook, and the use of Facebook in Education, were used by the members twice in two weeks (OC30.4, OC7.5). These suggestion statements were utilised to develop the task process for their task (CT2A30.4, CT2A7.5). For instance, Zaki stated "I suggest including the advantages and disadvantages of Facebook and its uses" (CT2A30.4). Haytham attempted to develop the task by stating:

I suggest to organise the product by the following topics: Definition of Facebook, the advantages and disadvantages of Facebook and the use of Facebook in Education. In my opinion, these topics will give us a broad idea of Facebook, then we can provide detailed information about the use of Facebook in Education which is the most important (CT2A7.5).

Confirmation or agreement statements were recorded in the online discussions twice in two weeks (OC30.4, OC7.5). These confirmation statements were used to agree with the selection of Facebook as a topic for the task. For example, Qasem stated "I agree with Zaki's initiation to select Facebook" (CT2A30.4), and to agree with the creation of an audio file. For example, Haytham stated "I agree with guys to create a podcast of Facebook for our product" (CT2A7.5).

Group's final product

This group was required to submit 500 words in week 11, and then to submit an audio or video file in week 13 based on the group members' online discussions. Each member was required to post a minimum of five responses to discuss the task and each response must contain at least 100 words, as required for the previous task.

The group members submitted their plan of 520 words in the Bb system on the due date (week 11). They organised their plan based on the topics they discussed in the discussion forum. They planned to define Facebook as the topic of their final product supported by other topics such as the advantages and disadvantages of Facebook, and the use of Facebook in Education. This group submitted their final product in the Bb system on the due date (week 13). This group created an audio file including only two topics which were a definition of Facebook, and the advantages and disadvantages of Facebook. However, the members planned and discussed three topics in the online discussions (CT2B21.5). This means that the group's work was not directly reflected in their final product. In the group's task, the students defined Facebook as a social website and described its advantages and disadvantages in general. The use of Facebook in Education did not obviously emerge. However, this topic was discussed as an important part of the group's task in the discussion forum. This group received an average mark due to the lack of relation of the task's content to the online discussions' content.

Social/Cultural issues

The individual roles and participation levels are described to examine the social/cultural issues. Zaki appeared to be the most active member or the leader of the group who initiated the group's process. He attempted to direct the group to select Facebook as the topic for the group's task as he stated "why do not we choose it?" (CT2A30.4). After this, he defined Facebook and its applications and encouraged his peers to participate. In addition, he attempted to develop the task by suggesting to include its advantages and disadvantages (CT2A30.4). Qasem was a less active member who provided additional information about Facebook to support Zaki's idea and to keep the group on track. He also provided the reasons for using Facebook by stating "Why do we use Facebook?" (CT2A30.4). Haytham seemed to be the least active member. He attempted to develop the task by suggesting to organise the product and include the use of Facebook in Education as he stated "we can provide detailed information about the use of Facebook in Education which is the most important" (CT2A7.5). From the students' contributions, this group had uneven participation levels. This emerged as the task was defined by only one member, the task was developed by two members, and the group was directed by two members.

Students' interaction with the teacher

The group members were encouraged to respond to the teacher's question posted in the discussion forum. It was provided to help the students think about the topic of the Task 2. The question was "What is educational communication?". The group members posted three responses in the discussion forum in response to the teacher's question (OC7.5). One student defined educational communication as "a dialogue about behaviour that occurs between two people or more to discuss educational topics" (DT7.5). Another student defined it as the way of communication "this educational dialogue should be organised in face-to-face mode" (DT7.5). However, one student defined it as "it has different advantages such as supporting educational ideas, solving educational problems and enhancing social relations" (DT7.5). It was

expected that these students would interact more with the teacher's question. It also appeared that this interaction was not directly reflected in their task.

2. Email tool

Students' interaction with others and with the teacher

This tool was organised as an optional asynchronous tool to be used for discussion on the collaborative tasks. The email transcripts indicate that none of these group members used the email tool for interaction to complete Task 2. (ET16.4, ET23.4, ET30.4, ET7.5).

3. Chat tool

Students' interaction with others and with the teacher

As described, this tool was designed for synchronous interactions between the students and with the teacher. There were four chat sessions organised by the teacher (from week 8 to week 11) to discuss the requirements of Task 2 with the students. The chat tool transcripts indicate that none of these group members participated in any of these chat sessions (CT16.4, CT23.4, CT30.4, CT7.5).

4. Journal tool

Students' interaction with others and with the teacher

This tool was designed to enable the students to reflect on the content of the subject and on their own learning. In this group, two members (Zaki & Qasem) used this tool to reflect on their own collaborative learning in five responses through the completion of Task 2 (OC16.4, OC23.4, OC30.4, OC7.5). For example, Qasem reported that "my personal skills, especially my collaborative skills are getting

improved. I feel this from day to day" (JT30.4). In addition, Zaki reported that "the discussion forum is one of the positives of the subject. This tool provides me with a lot of skills and experiences" (JT16.4).

Technical issues/ contextual factors

In this group, Qasem reported that the lack of Internet and computer access in the computer lab impacted upon the completion of Task 2 (JT7.5, SPOI29.5).

Summary

All three members used the discussion forum and met the requirements of the task. In this task, this group had uneven participation levels and individual roles were defined due to disparity in their contributions. However, in Task 1, this group had relatively equal participation levels and individual roles were not clearly defined. In addition, the results indicated that the three members interacted with the teacher's question posted for Task 2. However, none of these members used the email and chat tools.

Despite this group receiving an average evaluation mark, the group members' collaboration was successful overall because these students met the requirements of the task and their reflections on their learning were generally satisfactory (JT16.4, JT30.4). It was expected that these members would collaborate more. They only interacted in two weeks over four. This could refer to the limitations that these students reported, such as a lack of Internet and computer access in the computer lab.

Group B/Task 1

Students' background

This group had three members (Meteb, Ammar & Khalid) who enrolled in the subject "*Producing and Using Instructional Tools*" in the Faculty of Education at KFU. The preliminary interviews were conducted to examine their cultural and social backgrounds, their beliefs, and personal factors that affect their use of technology and collaboration. The findings indicated that one member (Meteb) came from a small village around the city. Two members (Ammar & Khalid) came from other cities a few hundred kilometres from KFU. Those students travelled by car or train to attend their classes at the university (SPI6.3). Ammar and Khalid reported that they live in large families of six to ten members. Meteb reported that he lives in a family of three to five members (SPI6.3). All group members reported that their parents have low levels of education with low monthly incomes (SPI6.3).

These group members reported face-to-face instruction in high school and at KFU (SPI6.3). These group members reported that they have PCs and Internet access at home. Meteb and Ammar reported using the Internet for general browsing, checking emails, and participating in public discussion forums. Khalid reported using the Internet for checking emails, participating in public discussion forums, and maintaining a personal Facebook account (SPI6.3). Ammar and Khalid reported using the Internet for about ten hours a week. However, Meteb reported that he uses the Internet for only three hours a week (SPI6.3). None of these group members reported having used the Internet for learning or educational purposes (SPI6.3).

1. Discussion forum

Students' interaction

As described, students were required to use this tool to discuss the two collaborative tasks. The three group members used the online discussions, and they are coded at

the sentence level (tasks definition, task process, confirmation, suggestion and disagreement) from week 3 to week 7. Table 5.3 shows the frequencies of these codes derived from the group interactions in the discussion forum.

Table 5.3 Frequencies of the codes based on the group members interactions.

Week	Student	Codes	Frequency 'N'
3	Meteb	Task definition	1
		Task process	1
		Suggestion	0
		Confirmation "agreement"	0
		Disagreement	0
3	Ammar	Task definition	0
		Task process	1
		Suggestion	1
		Confirmation "agreement"	1
		Disagreement	0
3	Khalid	Task definition	0
		Task process	0
		Suggestion	0
		Confirmation "agreement"	0
		Disagreement	0
4	Meteb	Task definition	0
		Task process	1
		Suggestion	0
		Confirmation "agreement"	0
		Disagreement	0
4	Ammar	Task definition	0
		Task process	0
		Suggestion	2
		Confirmation "agreement"	1
		Disagreement	1
4	Khalid	Task definition	0
		Task process	0
		Suggestion	0
		Confirmation "agreement"	0
		Disagreement	0
5	Meteb	Task definition	0
		Task process	0
		Suggestion	0
		Confirmation "agreement"	0
		Disagreement	0
5	Ammar	Task definition	0
		Task process	0
		Suggestion	1
		Confirmation "agreement"	0
		Disagreement	1

5	Khalid	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 1 0 1 1
6	Meteb	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 0 1 0 0
6	Ammar	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 1 1 0 0
6	Khalid	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 1 0 1 0
7	Meteb	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 0 0 1 0
7	Ammar	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 0 1 0 0
7	Khalid	Task definition Task process Suggestion Confirmation "agreement" Disagreement	0 0 1 1 0

Note.

1. Task definition: Relates to the way of how the group members understand the task and identify the topic.
2. Task process: Relates to how the group members keep the group on track.
3. Suggestion: Relates to how the group members suggest alternatives and solutions to develop the task.
4. Confirmation "agreement": Relates to the statements include "Yes" or "agree", or consist of any agreement in any other way.

From online observations, task definition only occurred once in the online discussions of this group over five weeks (OC12.3). For example, Meteb defined the task based on his understanding. He stated:

Technology in Education can be defined in more than one way due to the development of technology and its several advantages which can support Education directly or indirectly, but it is better to define it as the way in which online learning is different from traditional learning (CT1A12.3).

Suggestion statements were the most frequent activity (n=8, over five weeks). These suggestions were used to develop the task by providing alternatives and solutions for the final product, and were used to organise the final version. For example, the group members suggested to include the significance of using technology in Education, implications of using technology in Education, importance of technology and the teacher's role in the learning process, examples of technology tools in Education, and relevant pictures to support the topic. For example, Khalid suggested focusing on the reasons for using technology. He stated:

I suggest to stress on the reasons for using technology. I think the discussion of the reasons will help create a variety of different topics which guide us to identify the important issues and connect them with each other (CT1A17.3).

Additionally, Ammar suggested focusing on one example of technology tools. He stated:

I suggest to focus on one example only as alternative with the inclusion of two pictures. I think it is better to focus on one example with concentrated information than different examples with scattered information (CT1A26.3, CT1A2.4).

He also suggested organising the group work (website) based on definition of technology in Education, the significance and the implications of using technology in Education (CT1A12.3). Discussion about the task occurred six times in four weeks in order to add information and elaborate on a specific topic. For example, the students attempted to orient the group by providing information about the importance of using

technology in Education, benefits of using technology in Education, and reasons for using technology in Education. In this instance, Meteb stated:

We should focus on the importance of using technology in Education and we need to stress on the student learning because the student is the basis of educational process. It is important to understand the role of the use of technology in supporting student learning in the classroom (CT1A12.3, CT1A17.3).

Confirmation or agreement statements were used six times in five weeks (OC12.3, OC17.3, OC26.3, OC2.4, OC9.4). Task definition, suggestions, and the task process were discussed. For example, Ammar stated "I agree with Meteb to define the task based on the differences between online learning and traditional learning" (CT1A12.3). Another student stated "I agree with Ammar's suggestion to include pictures for the final product" (CT1B9.4). Disagreement statements were the least frequent activity (n=3, over two weeks) (OC17.3, OC26.3). Khalid disagreed with his peers to include the importance of technology of the teacher role in the learning process, and to focus on one example only for the final product (CT1A17.3, CT1A26.3). Ammar disagreed with his colleague to stress on the importance of technology on student learning. He stated "I disagreed with Meteb, we should stress on both teachers and students" (CT1A26.3).

Group's final product

This group was required to submit 500 words in week 6, and then to submit a website platform in week 8 based on the group members' online discussions. Each member was required to participate in a minimum of five postings to discuss the task and each posting must consist of at least 100 words.

These group members submitted 750 words in the Bb system on the due date (week 6). They organised their plan based on the topics they discussed in the discussion forum as they defined various topics related to the use of technology in Education,

such as definitions of technology in Education, the significance of using technology in Education, the implications of using technology in Education, the reasons for using technology in Education, and examples of technology tools in Education.

This group submitted their final product (website) in the Bb system on the due date (week 8). This group created a website including only three topics which were definitions of technology in Education, the reasons for using technology in Education, and examples of technology tools in Education. However, these members discussed five topics in the discussion forums as described (CT1B16.4). This means that the group members' work was not directly reflected in their final product. On this group's website, the students defined the term of technology in Education and described the role of technology in solving education problems. They described the reasons for using technology in Education supported by learning theories, and psychological and cognitive foundations. In addition, these students described three examples of using technology in Education including virtual classrooms, interactive videos, and digital libraries. However, these examples were not discussed in the online discussions. Therefore, this group received an average mark due to the lack of relation of their task's content to the online discussions' content.

Social/Cultural issues

To illuminate the social/cultural matters derived from the students' interactions, the individual roles of the group members and their participation levels through their responses are described. In this group, each member posted his own thoughts about the topic, and the three group members shared individual roles and supported each other. Therefore, the individual roles were not clearly defined. The students attempted to orient the group in a direction by providing information about the topic. For example, Meteb provided information about the importance of using technology in Education (CT1A12.3), Ammar added information about the definition of technology in Education. He stated "if the term of technology in Education is well-defined, this will lead us to understand the significance and the implications of using

technology in Education" (CT1A2.4) and Khalid stressed on the reasons for using technology in Education (CT1A2.4). They also shared suggestions to develop the task. For instance, Meteb suggested to include pictures in the final product (CT1A2.4), Ammar suggested to include the importance of technology and the teacher's role in the learning process (CT1A17.3). Khalid suggested stressing the reasons for using technology in Education (CT1A17.3).

This group had uneven participation levels. Meteb defined the task based on his understanding and all three group members attempted to steer the group to the task process. However, Ammar suggested five alternatives of eight suggestions recorded in the complete online discussions to develop the task process. In this instance, he suggested to include the significance of using technology, the implications of using technology in Education, the importance of technology and the teacher's role in the learning process (CT1A12.3, CT1A17.3). He also suggested focusing on one example only, with the inclusion of two pictures for the final product (CT1A26.3, CT1A2.4).

Students' interaction with the teacher

As described, the students were encouraged to respond to the teacher's questions posted in the discussion forum. These questions were:

- What do you know about technology in Education?
- What are technology tools?
- Why do we use technology tools?
- What are the norms of technology tools selection?

The group members posted 15 responses in the discussion forum (OC12.3, OC17.3, OC26.3, OC2.4). All three group members respond to the first question "What do you know about technology in Education?". Those students attempted to interact with this question by providing different definitions. For example, a student defined the

term of technology in Education as "new tools of Education that can be used to enhance the learning process" (DT12.3). Another student stated "it is a method of delivery that can transfer information in a short time" (DT12.3). All three members also responded to the second question "What are technology tools?". For example, one student described technology tools that can improve teacher's and student's skills (DT17.3). Two students responded to the third question "Why do we use technology tools?". In this instance, Meteb stated "it leads to the improvement of teachers' skills as well as teaching strategies" (DT26.3). Khalid stated "it leads to increase the student motivation for learning" (DT26.3). In addition, all three group members responded to the third question "What are the norms of technology tools selection?". For instance, one student described that technology tools should be selected based on the consistency of technology tool with the teacher's and student's ability, and with the nature of the subject (DT2.4). It was expected that these questions would assist the students to understand different topics of technology in Education and help them create connections for their final product via their interactions with the teacher. However, it seemed that this interaction was not reflected in the group's task.

2. Email tool

Students' interaction with others and with the teacher

The email tool was designed as an optional asynchronous tool to be used for relevant discussion on the collaborative tasks. The email transcripts show that none of these group members used the email tool for interaction to complete the task, or to communicate with each other or the teacher (ET12.3, ET17.3, ET26.3, ET2.4, ET9.4).

3. Chat tool

Students' interaction with others and with the teacher

The chat tool was designed for synchronous interactions between students and with the teacher. The chat tool transcripts show that two students used the chat session in week 4 (CT17.3) and one student used it in week 5 (CT26.3). For example, Ammar stated "it is important that we know the way how to discuss our topics for the task. So, it becomes easier for us to connect them each other" (CT17.3). Meteb stated "I think we need more information about our topics to meet the requirements of the task" (CT17.3). These two chat sessions were organised by the teacher to discuss the requirement of Task 1.

4. Journal tool

Students' interaction with others and with the teacher

The journal tool was designed to allow the students to reflect on the content of the subject and on their own learning. In this group, the three members used this tool to reflect on their own collaborative learning environment through their completion of the task (OC12.3, OC17.3, OC26.3, OC2.4, OC9.4). Two students reflected on their interaction within their groups in four responses. For example, Meteb reported "I am excited to use technology tools on Blackboard. I think collaborative learning is useful for students, but the teacher should supervise us" (JT12.3). The three group members reflected on the limitations of completion of the task in three responses. For instance, Ammar and Khalid reported that difficulties with Internet and computer access in the computer lab restricted the group to complete the task (JT2.4, JT9.4). In addition, Meteb reported that problems of communication with group members' limited group work to complete the task (JT26.3).

Technical issues/contextual factors

The students' collaboration demonstrated technical or contextual factors that could support or inhibit the use of technology and collaboration. In this group, two students reported that lack of Internet and computer access in the computer lab were the factors that impacted on the completion of the task (JT2.4, JT9.4, SII10.4). Another student reported that there were difficulties in communication between the group members. For example, Meteb stated "I have problems of communication with my peers to complete Task 1. These difficulties may occur because of the different places of living" (JT26.3).

Summary

All three students used the discussion forum and met the requirements of the task. This group had uneven participation levels as they all attempted to steer the group. However, only one student defined the task while another student suggested five alternatives in developing the task. Individual roles were not clearly defined as these members supported each other to complete the task. All three members interacted with the teacher and responded to the questions posted for the task, and two students used the chat sessions. However, none of these group members used the email tool. Although this group received an average evaluation mark, the collaboration of this group was successful overall because these students met the requirements of the task and their reflections on their own learning were generally satisfactory (JT12.3). Despite the limitations that the members reported, such as difficulties with Internet and computer access, and the problems of communication with the group members, these students interacted with each other in all of the five weeks.

Group B/Task 2

1. Discussion forum

Students' interaction

The group members' online discussions are coded at the sentence level (task definition, task process, confirmation and suggestion) from week 8 to week 11. These codes demonstrate the decision functions that the group took to reach the final decision to complete the task (creation of audio or video files). Table 5.4 shows the frequencies of these codes derived from the group interactions in the discussion forum.

Table 5.4 Frequencies of the codes based on the group members interactions.

Week	Student	Codes	Frequency 'N'
8	Meteb	Task definition	1
		Task process	0
		Suggestion	0
		Confirmation "agreement"	0
8	Ammar	Task definition	0
		Task process	0
		Suggestion	0
		Confirmation "agreement"	0
8	Khalid	Task definition	0
		Task process	1
		Suggestion	0
		Confirmation "agreement"	1
10	Meteb	Task definition	0
		Task process	1
		Suggestion	0
		Confirmation "agreement"	1
10	Ammar	Task definition	0
		Task process	0
		Suggestion	1
		Confirmation "agreement"	1
10	Khalid	Task definition	0
		Task process	0
		Suggestion	0
		Confirmation "agreement"	0

Note.

1. Task definition: Relates to the way of how the group members understand the task and identify the topic.
2. Task process: Relates to how the group members keep the group on track.
3. Suggestion: Relates to how the group members suggest alternatives and solutions to develop the task.
4. Confirmation "agreement": Relates to the statements include "Yes" or "agree", or consist of any agreement in any other way.

Based on the online observation document, this task was defined only once by one member in week 8 (OC16.4). In this instance, Meteb defined the email tool as a topic for task 2. He stated:

Email is the most common tool in the Internet. It can be used for multiple purposes such as communication, education, as well as news and information transfer without high cost. It also much better than telephone and fax (CT2A16.4).

Confirmation or agreement statements were the most frequent activity (three times in two weeks) (OC16.4, OC30.4). These agreement statements were used to confirm the topics to be included, or to confirm topics for elaboration. For example, Ammar stated "I agree with you guys to select email tool as a topic of our product" (CT2A30.4). In another example, Meteb stated "I agree with Khalid to stress on the importance of the use of email in communication" (CT2A30.4).

Discussions about task process occurred twice in two weeks (OC16.4, OC30.4). The group members attempted to orient the group to the task process by stressing on specific topics or elaborating on their descriptions such as definitions of email, the importance of email in communication, the advantages and disadvantages of email, and the use of email in Education. For instance, Meteb elaborated on the importance of email in communication. He stated:

Email is the important tool of communication and its benefits are several. People can build their social relations such as friendships by using email regularly. It also enhances cultural considerations among people from different

countries. In addition, it has benefits in educational communication in supporting the relationship between teachers and their students (CT2A30.4).

Khalid interacted with Meteb's topic of benefits of educational communication through email. He stated:

There are a lot of benefits of the use of email in communication between teacher and students. One of them is that they may contact with each other any time if they could not discuss in the class (CT2A16.4)

Suggestion including descriptions of email, the significance of email in communication, the advantages and disadvantages of email, and the use of email in Education (CT2A30.4) was used once in week 10 by one member to develop the task (OC30.4). Ammar tended to develop the task and group work. He stated:

I suggest including the following topics in our product: Description of email, the importance of email in communication, the advantages and disadvantages of email, and the use of email in Education (CT2A30.4)

Group's final product

This group submitted 500 words in the Bb system on the due date (week 11). They defined email as a topic for their task and submitted it in the Bb system on the due date (week 13). The members submitted an audio file including the topics which were a definition of email, the advantages and disadvantages of email in Education, and the applications of the use of email in Education. However, the members planned and discussed different topics (CT2B21.5). This shows that the group's work was not directly reflected in their task. In this task, the members defined email as a learning tool and they described its advantages and disadvantages in the learning environment. They also described several applications of using emails in educational settings. However, they discussed these topics for general communication in the discussion forum. This group received an average mark due to the lack of relation of task's content to the online discussions' content.

Social/ Cultural issues

The individual roles and participation levels are described based on the students' contributions. Meteb seemed to be the most active member or the leader who initiated the group's process. He tended to steer the group to select email as he stated "Email is the most common tool in the Internet" (CT2A16.4). Following this, he defined email and its role of communication and encouraged his colleagues to participate. He stated "it has benefits in educational communication in supporting the relationship between teachers and their students" (CT2A30.4). Khalid was a less active member. He provided additional information about email to support Meteb's concept and to keep the group on track. In addition, he elaborated on the benefits of the use of email in communication (CT2A16.4). Ammar appeared to be the least active member. He suggested to include topics (description of email, the significance of email in communication, the advantages and disadvantages of email, and the use of email in Education) in order to develop the task and organise the group's product (CT2A30.4). Based on the student's contributions, this group had uneven participation levels. This emerged as the task was defined and developed by only one member, and the group was oriented by two members.

Students' interaction with the teacher

The group members were encouraged to respond to the teacher's question posted in the discussion forum. The question was "What is educational communication?". This question was provided to help these group members think about the topic of Task 2. It was expected that this question would help the students understand different issues related to synchronous and asynchronous tools in Education, and this can enable them to build connections for their task. However, the discussion forum transcripts show that none of these group members interacted with the teacher's question for Task 2 (DT16.4, DT23.4, DT30.4, DT7.5).

2. Email tool

Students' interaction with others and with the teacher

The email transcripts show that none of these group members used the email tool for interaction to complete Task 2 from week 8 to week 11 (ET16.4, ET23.4, ET30.4, ET7.5).

3. Chat tool

Students' interaction with others and with the teacher

The chat tool transcripts showed that none of these group members used any of these chat sessions organised by the teacher from week 8 to week 11 (CT16.4, CT23.4, CT30.4, CT7.5). These chat sessions were set to discuss the requirements of Task 2.

4. Journal tool

Students' interaction with others and with the teacher

In this group, two members (Meteb & Khalid) used this tool to reflect on the limitations of the completion of the task in two responses (OC16.4, OC7.5). These students reported that the lack of Internet access in the computer lab restricted group work. For example, Meteb reported that "the problem of the Internet connection restrains our interaction in the discussion forum. It is hard to post our participation" (JT16.4). In addition, Khalid stated "I cannot believe it, I always find problems of connection when I access the Internet" (JT7.5).

Technical issues/ contextual factors

In this group, two students (Meteb & Khalid) reported that the problem of Internet access in the computer lab impacted upon the group's work and interactions to complete Task 2 (JT16.4, JT7.5, SPOI29.5).

Summary

All three members used the discussion forum and met the requirements of the task. In this task, the group had uneven participation levels as they were in Task 1. In addition, the individual roles were defined based on student participation. However, these roles were not clearly characterised in Task 1. The results showed that none of these group members interacted with the teacher's question posted for Task 2 or used the email or chat tools. The group members' collaboration was successful overall because the members met the requirements of the task. It was expected that these members would collaborate more. They only interacted in two weeks. This could be due to technical issues such as the lack of Internet access in the computer lab.

Group C/Task 1

Students' background

This group had three members (Luai, Khalil & Anas) who enrolled in the subject "*Producing and Using Instructional Tools*" in the Faculty of Education at KFU. The findings of the preliminary interviews indicated that one member (Luai) came from a small village around the city and two members (Khalil & Anas) came from other cities a few hundred kilometres from KFU. These students travelled by car or train to attend their classes at KFU (SPI6.3). Luai and Khalil reported that they live in large families of six to ten members. Anas reported that he lives in a family of three to five members (SPI6.3). All group members reported that their parents have low levels of

education (SPI6.3). Khalil and Luai reported that their parents work in the private sector. Anas reported that his father runs his own business (SPI6.3).

All group members reported face-to-face instruction in high school and at KFU (SPI6.3). Luai and Khalil reported that they have PCs and Internet access at home and reported using the Internet for about ten hours a week for general browsing, checking emails, participating in public discussion forums, and maintaining personal Facebook accounts. Anas reported that he has a shared computer with his family members at home. He reported using the Internet for about ten hours a week for general browsing and checking emails only (SPI6.3). Furthermore, none of these students reported having used the Internet for learning or educational purposes (SPI6.3).

1. Discussion forum

Students' interaction

All three group members used this tool for online discussions. They are coded at the sentence level (tasks definition, task process, confirmation, suggestion, disagreement and social statement) from week 3 to week 7. Table 5.5 shows the frequencies of these codes derived from the group interactions in the discussion forum.

Table 5.5 Frequencies of the codes based on the group members interactions.

Week	Student	Codes	Frequency 'N'
4	Luai	Task definition	0
		Task process	0
		Suggestion	1
		Confirmation "agreement"	1
		Disagreement	0
		Social statement	0
4	Khalil	Task definition	1
		Task process	2
		Suggestion	0
		Confirmation "agreement"	0
		Disagreement	0

		Social statement	0
4	Anas	Task definition	0
		Task process	0
		Suggestion	1
		Confirmation "agreement"	1
		Disagreement	1
		Social statement	0
6	Luai	Task definition	0
		Task process	0
		Suggestion	1
		Confirmation "agreement"	0
		Disagreement	0
		Social statement	1
6	Khalil	Task definition	0
		Task process	0
		Suggestion	0
		Confirmation "agreement"	0
		Disagreement	0
		Social statement	0
6	Anas	Task definition	0
		Task process	1
		Suggestion	0
		Confirmation "agreement"	0
		Disagreement	0
		Social statement	0
7	Luai	Task definition	0
		Task process	0
		Suggestion	0
		Confirmation "agreement"	2
		Disagreement	0
		Social statement	0
7	Khalil	Task definition	0
		Task process	0
		Suggestion	1
		Confirmation "agreement"	1
		Disagreement	0
		Social statement	0
7	Anas	Task definition	0
		Task process	0
		Suggestion	1
		Confirmation "agreement"	0
		Disagreement	0
		Social statement	0

Note.

1. Task definition: Relates to the way of how the group members understand the task and identify the topic.
2. Task process: Relates to how the group members keep the group on track.
3. Suggestion: Relates to how the group members suggest alternatives and solutions to develop the task.

4. Confirmation "agreement": Relates to the statements include "Yes" or "agree", or consist of any agreement in any other way.
5. Social statement: Relates to any statement that is not relevant to the decision task.

From online observations, task definition only occurred once in the online discussions over five weeks (OC17.3). Khalil attempted to define the term of technology in Education. He stated:

if we would define technology, we should think about its meaning and components. What is technology in Education and what are its components in your opinion guys?. These questions will guide us to the right direction to define the technology, and determine the other topics related to its components (CT1A17.3).

Suggestion statements appeared to be the most frequent activity (n=5, over five weeks). The members suggested including the reasons for using technology in Saudi Education, educational problems in Saudi Education and solutions, definitions of technology in Education, the importance of using technology, and examples of technology tools in Education. For example, Luai suggested focusing on the reasons for using technology in Saudi Education. He stated:

Why is the use of technology important in Saudi Education?. I believe that this question is important because it will let us focus on the Saudi Education in particular, I think we need to elaborating on this issue as our education has many educational problems which need to be resolved, and the technology may be one of these solutions (CT1A17.3).

Confirmation or agreement statements occurred five times (n=5, over five weeks). For example, Anas agreed with Khalil to focus on the definition of technology in Education, and Luai stated "I agree with Khalil to think about the reasons for using technology" (CT1A17.3).

Discussion about the task process was used three times (n=3, over five weeks) by two members (Khalil & Anas) in order to elaborate on specific topics to include in their task (OC17.3, OC2.4). These two students attempted to steer the group by

providing information about the importance of technology in Education, the reasons for using technology, and examples of technology tools in Education. For example, Khalil encouraged his peers to think about the significance of the use of technology in Education, and he provided some examples of technology in Education such as computer software and video-conference in order to orient the group in a direction (CT1A17.3). Similarly, Anas attempted to keep the group on track by elaborating on the importance of the use of technology and its aims in the learning process (CT1A2.4). A disagreement statement was only used once in the online discussions over five weeks (OC17.3). In this instance, Anas disagreed with Luai to focus on the reasons for using technology, especially in Saudi Education. He stated "I disagreed with Luai to stress on the reasons for using technology in Saudi Education. I suggest to think about the reasons for using technology in general" (CT1A17.3). A social statement also occurred once only in the discussions over five weeks (OC2.4). For example, Luai used the Islamic statement "As- Salamu Alaykum" which means greeting. He also asked his peers about their health and families at the commencement of his discussion (CT1A2.4).

Group's final product

These group members submitted 650 words in the Bb system on the due date (week 6). Their plan was based on the topics they discussed in the discussion forum. These topics were definitions of technology in Education, the importance of using technology in Education, the reasons for using technology in Education, examples of using technology in Education, and Saudi educational problems and solutions.

This group submitted their final task (website) in the Bb system on the due date (week 8). This group created a website including only three topics which were definitions of technology in Education, the importance of using technology in Education, and the reasons for using technology in Education. However, the group members discussed five topics in the online discussions as described (CT1B16.4). This indicated that the group members' work was not directly reflected in their final

task. On this group's website, the group members defined the term of technology in Education and its components. They linked the definition of technology to its importance in Education and how this technology plays the role to solve educational problems. They also described the reasons for using technology in Education and its role in developing students' skills and learning outcomes. The examples of using technology in Education, and Saudi educational problems and their solutions did not emerge on the website. However, these topics were discussed in the online discussions. Instead, the students included the impact of the use of technology on the learning process. However, this topic was not discussed in the discussion forum. Therefore, this group received an average mark due to the lack of relation of their task to the content of the online discussions.

Social/Cultural issues

In this section, the individual roles and participation levels are described to examine social/cultural issues. In this group, Khalil appeared to be the most active member or the leader who initiated the group's process and attempted to keep the work on track. In this case, he asked his peers to think about the meaning and components of technology in order to define the term of technology in Education as he posted the question: "What is technology in Education and what are its components in your opinion guys?" (CT1A17.3). After this, he encouraged his peers to think about the importance of technology in Education and the reasons for using technology. He also provided some examples of technology in Education, such as computer software, in order to keep his group on track. In addition, he attempted to develop the task process and organise the group's work by suggesting the topics such as definitions of technology in Education, the importance of using technology in Education, examples of using technology in Education, and Saudi educational problems and solutions (CT1A9.4). Anas was less active and provided information about the importance of the use of technology and its aims in the learning process (CT1A2.4). He suggested thinking about the reasons for using technology in general instead of in the Saudi context, and to include relevant pictures in the final product (CT1A17.3, CT1B9.4).

Luai appeared to be the least active member. He used the online discussions and attempted to develop the task by suggesting to only focus on the reasons for using technology in Saudi Education, and he posted this question: "Why is the use of technology important in Saudi Education?" (CT1A17.3). He attempted to address an educational problem in Saudi Arabia and how this can be solved by technology as he stated:

the large number of students in Saudi classrooms causes low quality of Education. This can be solved by using technology such as computer programs and other technology tools (CT1A2.4).

Based on the students' individual contributions, this group had uneven participation levels. Despite opening up the topic for conversation, the task was defined by only one member. Two members attempted to steer the group to the task process. However, the three group members shared the interactions to develop the task process by suggesting alternatives and solutions.

Students' interaction with the teacher

As described, the students were encouraged to respond to the teacher's questions posted in the discussion forum. The group members posted 12 responses in the discussion forum to respond to the teacher's questions (OC12.3, OC17.3, OC26.3, OC2.4). There were seven postings from the three group members in response to the first question "What do you know about technology in Education?". The students interacted with this question to clarify in which way can technology be used as a teaching approach. One member defined technology in Education as "a teaching approach that can be used to transfer knowledge continuously regardless of the time and place" (DT12.3). Another student defined it as "a teaching method that provides the learners with different experiences for their own learning which cannot be obtained by the traditional teaching" (DT12.3). One student responded to the second question "What are technology tools?". He described technology tools that have the capacity to address the learner's senses through movement, experience or observation

(DT17.3). He also responded to the question "Why do we use technology tools?" as technology saves time and effort, and it has several applications that can be implemented in educational field (DT26.3). Two students responded to the question "What are the norms of technology tools selection?". One student described that technology tools should be selected according to the nature of the educational situation as well as the subject. However, another student confirmed that these tools should be selected based on individual student differences (DT2.4).

It was expected that the teacher's questions would help the students understand different issues related to technology in Education, and help them to concentrate on specific topics for their final task. However, it appeared that these group members' responses were similar to other responses from other groups and their interactions with the teacher were not reflected in their final product.

2. Email tool

Students' interaction with others and with the teacher

The email transcripts show that two members of this group participated six times in the email tool for interactions from week 3 to week 7. Khalil sent four messages to the teacher. Three messages were copies of his postings in the discussion forum to discuss the task with his peers, and one message was a notice of absence for a lecture (ET12.3, ET17.3). Luai sent two messages to the teacher. He reported that there was a lack of interaction between the members and that there were difficulties in communication "My group members have late postings which may cause difficulties in the task submission on the due date" (ET17.3).

3. Chat tool

Students' interaction with others and with the teacher

The chat tool transcripts show that Anas used the chat session in week 5 (CT26.3) and Khalil used it in week 6 (CT2.4). These two chat sessions were organised by the teacher to discuss the requirements of Task 1. In these chat sessions, those students discussed their topics with other group members and they asked the teacher and their peers for suggestions on their work. For instance, Anas stated:

We need more focused information about our topics, and also we need other group suggestions on the product. This will give us a good chance to improve it (CT26.3).

4. Journal tool

Students' interaction with others and with the teacher

Two members (Luai & Anas) used this tool to reflect on their own collaborative learning environment in four postings over five weeks (OC12.3, OC26.3, OC2.4, OC9.4). They reported other limitations such as the lack of Internet and computer access in the computer lab (JT2.4, JT9.4). Anas reflected on the group's interactions in two responses. For example, he reported that "group work is useful because it allows the members to share thoughts and experiences. However, there is a limitation of this learning environment such as poor air conditioning" (JT12.3).

Technical issues/ contextual factors

The students' interactions illuminated the technical or contextual factors that could support or inhibit the use of technology and collaboration. In this group, Luai and Anas reported that the lack of Internet and computer access in the computer lab were the factors that limited the completion of the task (JT2.4, JT9.4, SII10.4). In addition,

Luai reported that the requirement of 500 words was a limitation as the time duration was not enough to prepare a written plan (JT2.4).

Summary

All three students used the discussion forum and met the requirements for the task. The students' roles were clearly defined as Khalil seemed to be the leader who opened up the dialogue and encouraged participation from the group members. Anas was a less active member, orienting the group to the task process and suggesting alternatives in developing the task. Luai was the least active, suggesting only one topic to develop the task. This group had uneven participation levels as the task was defined by only one student whereas all three members participated to develop the task by suggesting solutions. The results of this group indicated that two students interacted with the teacher's questions posted for the task and two students used the chat sessions as well as the email tool.

Despite this group receiving an average evaluation mark, the students' collaboration was successful overall because they met the requirements of the task and their reflections on their own learning were generally satisfactory (JT12.3). It was expected that students would participate and interact more. They only collaborated in three weeks over five. This could be due to the restrictions that the members reported such as the lack of Internet and computer access in the computer lab or the requirement of 500 words for the task.

Group C/Task 2

1. Discussion forum

Students' interaction

The group members' online discussions were coded at the sentence level (task process, confirmation, suggestion and social statement) from week 8 to week 11. These codes clarify the decision functions that the group took to reach the final decision to complete the task. Table 5.6 shows the frequencies of these codes derived from the group interactions in the discussion forum.

Table 5.6 Frequencies of the codes based on the group members interactions.

Week	Student	Codes	Frequency 'N'
11	Luai	Task process	1
		Suggestion	0
		Confirmation "agreement"	2
		Social statement	0
11	Khalil	Task process	2
		Suggestion	1
		Confirmation "agreement"	0
		Social statement	1
11	Anas	Task process	1
		Suggestion	0
		Confirmation "agreement"	2
		Social statement	0

Note.

1. Task definition: Relates to the way of how the group members understand the task and identify the topic.
2. Task process: Relates to how the group members keep the group on track.
3. Suggestion: Relates to how the group members suggest alternatives and solutions to develop the task.
4. Confirmation "agreement": Relates to the statements include "Yes" or "agree", or consist of any agreement in any other way.
5. Social statement: Relates to any statement that is not relevant to the decision task.

Based on online observations, discussions about task process were used by the group members four times in one week (OC7.5). These members appeared to add information about the topics included in their task in order to steer the group. Different topics were discussed, such as definitions of email and its history, the use of email in educational communication, and the advantages and disadvantages of email as learning tool. For example, Khalil attempted to draw the group members' attention to the email tool as he stated "We would like to select email as a topic to create our product, what do you think guys?" (CT2A7.5). After this, he stated:

Email is an appropriate tool to be selected and discussed for our product. It has a meaningful history for communication which can also be useful in education field as it contains various advantages for learning (CT2A7.5).

Additionally, Luai elaborated on the topic. He stated:

To provide information on the definition of email, I think we look at more focused information about this tool to clarify how this tool can be used in educational communication, either between students or between students and the teacher (CT2A7.5).

Confirmation or agreement statements were used by the members four times in one week (OC7.5). These statements were used to confirm topics to be included, or to confirm the members' suggestions. For example, Luai stated "I agree with Khalil's idea that the use of email is common, especially for communication. I agree with him to select it" (CT2A7.5). In another example, Anas agreed with Khalil's suggestion as he stated "I agree with Khalil's suggestion to include the use of email in Education, the advantages and disadvantages of email as learning tool" (CT2A7.5). A suggestion statement including the use of email in Education and the advantages and disadvantages of email as learning tool was used once in week 11 in order to develop the task (OC7.5). In addition, a social statement was used once by a member before the commencement of his discussion. In this instance, Khalil used the Islamic statement "As- Salamu Alaykum" for greeting, then he attempted to direct his group

to the topic as he stated "We would like to select email as a topic to create our product, what do you think guys?" (CT2A7.5).

Group's final product

These group members submitted 525 words in the Bb system on the due date (week 11). They planned to create a task based on the topics they discussed in the online discussions. They selected email as the topic for their task supported by other sub-topics such as definitions of email, the use of email in educational communication, the history of email use, and the advantages and disadvantages of email as a learning tool. The members submitted their task in the Bb system on the due date (week 13). They created an audio file including a definition of email and its history, the importance of using email for educational communication between teachers and students, applications of the use of email in Education, and the advantages and disadvantages of using email (CT2B21.5). Furthermore, they focused on the importance of using email between teachers and students, which was not discussed in the discussion forum. This implies that the group's work was not directly reflected in the task. Thus, this group received an average mark due to the lack of relation of the task's content to the online discussions' content.

Social/ Cultural issues

The individual roles and participation levels are described based on the students' contributions. Khalil appeared to be the most active member or the leader who guided the group's process. He attempted to direct his group to the topic as he stated "We would like to select email as a topic to create our product" (CT2A7.5). After this, he also attempted to orient the group in a direction by elaborating on the description of email as a tool for communication. In addition, he tended to develop the task and suggested to include the use of email in Education, and the advantages and disadvantages of email as learning tool. Anas was a less active member. He

responded to Khalil's initiation to select email as a topic and he stated "I was thinking to suggest discussion forum for our product, but if you both agree with email, that will be fine with me" (CT2A7.5). Following this, he attempted to keep the group on track by providing information about the history of using email. Luai was the least active member. He tended to support his peers by elaborating on the use of email for educational communication. He stated:

Email as intermediary between teachers and students, is the most important application in Education field where the teacher can send all required documents of the subject such as plan, references and assignments, and respond to the students' inquiries and suggestions (CT2A7.5).

Based on the students' contributions, this group had uneven participation levels as all three members steered the group to the task process. Only one member developed the task by suggesting alternatives and none of the group members defined the task.

Students' interaction with the teacher

As described, the teacher posted a question "What is educational communication?" in the discussion forum. It was expected that this question would help the group members think about the topic of the task and understand different issues relevant to synchronous and asynchronous tools in Education that would enable them to complete their final task. However, the discussion forum transcripts indicate that none of these group members interacted with the teacher's question posted for the task (DT16.4, DT23.4, DT30.4, DT7.5).

2. Email tool

Students' interaction with others and with the teacher

The email transcripts indicate that none of these group members used the email tool for interaction to complete Task 2 from week 8 to week 11 (ET16.4, ET23.4, ET30.4, ET7.5).

3. Chat tool

Students' interaction with others and with the teacher

The chat tool transcripts indicate that none of these group members used any of these chat sessions organised by the teacher from week 8 to week 11. These chat sessions were set to discuss the requirements of Task 2 (CT16.4, CT23.4, CT30.4, CT7.5).

4. Journal tool

Students' interaction with others and with the teacher

In this group, two members (Khalil & Anas) used this tool to reflect on the constraints of the completion of Task 2 in two responses (OC30.4, OC7.5). Khalil reported that the lack of Internet access in the computer lab was the most significant factor affecting the group's work to complete the task (JT30.4). On the other hand, Anas reported "There were problems of communication between the group members, particularly off-campus communication" (JT7.5).

Technical issues/ contextual factors

In this group, one student (Khalil) reported that the lack of Internet access in the computer lab restricted the group's work to complete Task 2 (JT30.4, SPOI29.5).

Summary

All three members used the discussion forum and met the task requirements. In this task, the participation levels were unequal due to disparity of the students' contributions, which was similar in Task 1. In addition, individual roles were defined based on the members' participation to complete the task, exactly as they were in Task 1 (Khalil was the most active member, Anas was a less active, and Luai was the least active). None of these group members used email or chat tools, or interacted with the teacher's question posted for Task 2. Collaboration was generally successful because the members met the requirements of the task, although it was expected that these students would collaborate more. They only interacted in one week. This could refer to the constraints that the members reported, such as the lack of Internet access in the computer lab or the difficulties in communication with the group members.

Group D/Task 1

Students' background

Tareq, Mosab and Zahed were the next three group members enrolled in the subject in the Faculty of Education at KFU. Two members (Tareq & Zahed) lived in the same city near KFU. However, one member (Mosab), came from another city a few hundred kilometres from KFU and travelled by car or train to attend his classes (SPI6.3). All group members reported that they live in large families of six to ten members (SPI6.3). Tareq and Zahed reported that their parents have Bachelor's degrees and work in governmental sectors with high monthly incomes. Mosab reported that his father has a low level of education and works in the private sector with a high monthly income (SPI6.3).

The group members reported face-to-face instruction in high school and at the university (SPI6.3). Tareq and Zahed reported that they have PCs and Internet access at home and reported using the Internet for about ten hours a week for general

browsing, checking emails, participating in public discussion forums and maintaining personal Facebook accounts. However, Mosab reported that he has a shared computer with his family members and the Internet access at home. He reported using the Internet for about ten hours a week for checking emails and participating in public discussion forums (SPI6.3). None of these students reported having used the Internet for learning or educational purposes (SPI6.3).

1. Discussion forum

Students' interaction

All three group members used this tool for the online discussions, which were coded at the sentence level (tasks definition, task process, confirmation, suggestion and social statement) from week 3 to week 7. Table 5.7 shows the frequencies of these codes derived from the group interactions in the discussion forum.

Table 5.7 Frequencies of the codes based on the group members interactions.

Week	Student	Codes	Frequency 'N'
4	Tareq	Task definition	1
		Task process	2
		Suggestion	0
		Confirmation "agreement"	0
		Social statement	0
4	Mosab	Task definition	0
		Task process	1
		Suggestion	0
		Confirmation "agreement"	1
		Social statement	0
4	Zahed	Task definition	0
		Task process	1
		Suggestion	0
		Confirmation "agreement"	2
		Social statement	0
6	Tareq	Task definition	0
		Task process	0
		Suggestion	1
		Confirmation "agreement"	0
		Social statement	1

6	Mosab	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 0 0 0 0
6	Zahed	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 0 0 0 0
7	Tareq	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 0 1 0 0
7	Mosab	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 0 0 1 0
7	Zahed	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 0 1 1 1

Note.

1. Task definition: Relates to the way of how the group members understand the task and identify the topic.
2. Task process: Relates to how the group members keep the group on track.
3. Suggestion: Relates to how the group members suggest alternatives and solutions to develop the task.
4. Confirmation "agreement": Relates to the statements include "Yes" or "agree", or consist of any agreement in any other way.
5. Social statement: Relates to any statement that is not relevant to the decision task.

From online observations, task definition only occurred once in the online discussions over five weeks (OC17.3). For instance, Tareq attempted to define the term of technology in Education. He stated:

We should define the term of technology and then define its role in Education. This term can be defined as a range of tools that can be utilised in the learning process to improve teaching and student learning. Improving teachers' and students' skills should be considered when we define its role in Education (CT1A17.3).

Confirmation or agreement statements appeared to be the most frequent activity (n=5, over five weeks), followed by discussion about task process (n=4, over five weeks). In this group, agreement statements were used by two members as task definition, suggestions, or task processes were agreed upon. For example, two members (Zahed and Mosab) agreed with Tareq to define the term of technology and its role in Education. They also agreed with Tareq's suggestions to include the benefits of the use of technology in Education and the significance of the use of technology in Education. Discussion about task process was used by the three members in order to orient the group in a direction. For example, Tareq provided information about the benefits of the use of technology in Education. He demonstrated the differences between traditional learning and online learning. He also asked his peers to think about the effectiveness of the use of technology in the learning process for both teachers and students (CT1A17.3). In addition, Zahed encouraged his group members to think deeply about technology in Education. He stated:

We agreed with Tareq to define the term of technology and its role in Education. We also have been informed of some of the differences between the traditional learning and online learning, but we need to think about this issue in the term of the application in the field of Education. This question may help: How can a teacher select an appropriate technology tool? (CT1A17.3).

Mosab also attempted to participate in steering the group as he stated "We need to think about the elements of technology in Education such as the learning process including teachers and students, educational tools or technology tools, and the learning context" (CT1A17.3).

Suggestion statements were used three times by two members (Tareq & Zahed) in order to provide alternatives and solutions for the task's development (OC2.4, OC9.4). For instance, Zahed suggested to include the significance of the use of technology in Education. He stated:

The importance of the use of technology determines the issues that are related to the implementation of technology in Education. This topic will give us the broad idea of technology in Education, then we can think deeply about the elements of technology in Education (CT1A9.4).

Tareq suggested including the following topics: Reasons for using technology in Education, the impact of using technology on the learning process, and examples of technology tools in Education. He stated "I think we need to finalise our work by including these topics as they cover the most of the elements of technology in Education" (CT1A2.4). He also suggested including relevant pictures in the group's website to support these topics (CT1B9.4). Social statements occurred twice in the online discussions of this group over five week (OC2.4, OC9.4). Two members used a greeting statement at the commencement of their discussions (CT1A2.4, CT1A9.4).

Group's final product

These group members submitted 535 words in the Bb system on the due date (week 6). They planned to produce their website based on the topics discussed in the discussion forum. These topics were a definition of technology in Education, the benefits of using technology in Education, the reasons for using technology in Education, the impact of using technology on the learning process, examples of technology tools in Education, and the significance of the use of technology in Education.

The group submitted their task (website) in the Bb system on the due date (week 8). Only three topics were included in their website, which were the reasons for using technology in Education, the impact of using technology on the learning process, and examples of technology tools in Education. However, the group members discussed six topics in the discussion forum as described (CT1B16.4). This shows that the group members' work was not directly reflected in their final product. On the group's website, the group members listed the reasons for using technology in Education, and described the impact of its use on the learning process for both teachers and students.

They also reviewed examples of technology tools such as visual tools, audio tools, and audio-visual tools, and presented their advantages and disadvantages in the learning environments. These examples were not discussed in the discussion forum by the members. In addition, it appeared that the topics included in their final product were separate and not connected. Thus, this group received an average mark due to the lack of relation of the task's content to the online discussions' content.

Social/ Cultural issues

In this group, Tareq seemed to be the most active member or the leader who initiated the group's process and attempted to keep the work on track. For example, he commenced to define the term of technology and its role in Education (CT1A17.3). Following this, he attempted to direct the group by reviewing the benefits of the use of technology in Education as he highlighted the differences between traditional learning and online learning. He also asked his group members to think about the effectiveness of the use of technology in the learning process for both teachers and students (CT1A17.3). He provided suggestions for various topics to develop the task (CT1A2.4, CT1B9.4). Zahed was a less active member. In this instance, he encouraged his peers to think deeply about the term of technology in Education (CT1A17.3). He also suggested including the significance of the use of technology in Education (CT1A9.4). Mosab was the least active member. He used the online discussions to keep the group on track as he encouraged his peers to develop the concept of the elements of technology in Education (CT1A17.3).

Based on the students' contributions, this group had unequal participation levels. The task was defined by only one member, and all three members attempted to orient the group to the task process. However, only two members developed the task process by suggesting alternatives and solutions. In addition, it appeared that there was a lack of interaction between the group members as the actual online discussions occurred in only two weeks (OC17.3, OC9.4).

Students' interaction with the teacher

The group members posted 11 responses in the discussion forum to respond to the teacher's questions (OC12.3, OC17.3, OC26.3, OC2.4). There were eight postings from the three group members in response to the first question "What do you know about technology in Education?". Those students interacted with this question to determine in which ways technology can be used to support the learning process including teacher, students, and the subject. One student defined technology in Education as "a developed system that facilitates communication between the teacher and students in order to gain knowledge" (DT12.3). Another student defined it as "a method that supports the learning process in order to eliminate boredom and obtain knowledge in a short time" (DT12.3). One student responded to the second question "What are technology tools?". He described the technology tools as visual, audio and audio-visual tools (DT17.3).

These types of technology tools emerged in their task when the members addressed the examples of technology tools. There was only one response to respond to the question "Why do we use technology?". He described technology as "a method that can support the learning process, improve teachers' and students' skills, and overcome time and place problems" (DT26.3). In addition, he was the only member who responded to the question "What are the norms of technology tools selection?". He referred to the selection of technology tools, the nature of the subject, the individual student differences, and the nature of the learning environment (DT2.4). It seemed that there were similarities in responses from other groups. The students' interactions with the teacher were not directly reflected in their final product, except the discussion of the examples of technology tools.

2. Email tool

Students' interaction with others and with the teacher

The email transcripts indicate that one member of this group used the email tool for interaction from week 3 to week 7. Tareq sent a message to the teacher identifying that there was a lack of interaction between the students and that there were difficulties in communication with the group members (ET17.3).

3. Chat tool

Students' interaction with others and with the teacher

The chat tool transcripts indicate that two members (Tareq & Mosab) used the chat session in week 4 (CT17.3), two members (Tareq & Zahed) used it in week 5, two members (Tareq & Mosab) used it in week 6 (CT26.3, CT2.4) and one member (Tareq) used it in week 7 (CT9.4). These chat sessions were organised by the teacher to discuss the requirements of Task 1. The students interacted with other group members and with the teacher. They tended to discuss their topics with the others and asked for suggestions on their work.

4. Journal tool

Students' interaction with others and with the teacher

In this group, the three members used this tool to reflect on their own collaborative learning within their groups in nine responses over five weeks (OC12.3, OC17.3, OC26.3, OC9.4). The students reflected on the limitations for Task 1. For example, they reported on the lack of Internet and computer access in the computer lab (JT26.3, JT9.4). Zahed reported that the requirement of 500 words limited the completion of the task because the time given was not enough to prepare a written plan of this length (JT9.4). In addition, Tareq reported that a lack of harmony and

difficulties in communication between the students limited the interaction between the members to complete the task (JT26.3).

Technical issues/ contextual factors

All three students reported that the lack of Internet and computer access in the computer lab impacted upon the completion of the task (JT26.3, JT9.4, SII10.4). In addition, Zahed reported that the requirement of 500 words was a constraint in completing the task as the time duration was not sufficient to prepare a written plan of this length (JT9.4, SII10.4). Tareq reported that there were difficulties in communication with the group members due to a lack of harmony. He reported "I guess, the lack of harmony between our group members may restrict the completion of the task" (JT26.3).

Summary

All three students collaborated in the discussion forum and met the requirements of Task 1. The students' contributions were clearly defined, as Tareq appeared to be the leader of the group and also attempted to open the discussion and encouraged interaction from his peers. Zahed was a less active member. He attempted to encourage the group members to define the term of technology in Education and he developed the task by suggesting an alternative. Mosab was the least active member. He used the discussions to develop only one concept. This group had unequal participation levels. This emerged when the task was defined by only one member. The group was steered to the task process by the all three members and the task was developed through suggestions by two. The results showed that two group members interacted with the teacher's questions posted for the task, all three group members used the chat sessions, and one member used the email tool.

Despite this group receiving an average evaluation mark, the students' collaboration was successful overall because the group members met the task requirements and their reflections on their own learning were generally satisfactory (JT12.3). It was expected that these students would interact more. The actual online discussions occurred in only two weeks over five. This could refer to the limitations that the students reported such as the lack of Internet and computer access in the computer lab and the requirement of 500 words for the task.

Group D/Task 2

1. Discussion forum

Students' interaction

The group members' online discussions are coded at the sentence level (task definition, task process, confirmation, suggestion and social statement) from week 8 to week 11. These codes indicate the decision functions that the group took to reach their final product. Table 5.8 shows the frequencies of these codes derived from the group interactions in the discussion forum.

Table 5.8 Frequencies of the codes based on the group members interactions.

Week	Student	Codes	Frequency 'N'
8	Tareq	Task definition	1
		Task process	1
		Suggestion	0
		Confirmation "agreement"	0
		Social statement	1
8	Mosab	Task definition	0
		Task process	0
		Suggestion	0
		Confirmation "agreement"	0
		Social statement	0
8	Zahed	Task definition	0
		Task process	0
		Suggestion	0
		Confirmation "agreement"	0

		Social statement	0
9	Tareq	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 0 1 0 0
9	Mosab	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 0 0 0 0
9	Zahed	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 0 0 0 0
10	Tareq	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 0 1 0 0
10	Mosab	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 0 0 0 0
10	Zahed	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 0 0 0 0
11	Tareq	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 1 0 0 0
11	Mosab	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 0 1 0 0
11	Zahed	Task definition Task process Suggestion Confirmation "agreement" Social statement	0 0 0 1 0

Note.

1. Task definition: Relates to the way of how the group members understand the task and identify the topic.

2. Task process: Relates to how the group members keep the group on track.
3. Suggestion: Relates to how the group members suggest alternatives and solutions to develop the task.
4. Confirmation "agreement": Relates to the statements include "Yes" or "agree", or consist of any agreement in any other way.
5. Scial statement: Relates to any statement that is not relevant to the decision task.

Based online observations, the task was defined only once by a member in week 8 (OC16.4). Tareq defined the task to his group members and drew their attention to the use of mobile phones and how they can be used in Education. He stated:

The use of mobile phone in Education is very important and it is called mobile learning. It allows educators to submit their materials on various mobile devices for learning. It also allows students to follow-up their exercises and assignments via mobile phones (CT2A16.4).

Suggestions including positives and negatives of mobile learning, definitions of mobile learning, advantages of the use of mobile learning, and the applications of mobile phone in Education were used by the members to develop the task (CT2A23.4, CT2A30.4, CT7.5). These statements were recorded three times in three weeks (OC23.4, OC30.4, OC7.5). For example, Tareq stated:

Each technology tool in Education has both sides positives and negatives that can support or prevent the desired benefits of this tool. So, I suggest to include positives and negatives of mobile learning, especially to take into account the students' individual differences (CT2A23.4).

Additionally, Mosab suggested "the following topics to be included in the group work: Definition of mobile learning, advantages of the use of mobile learning and the applications of mobile phone in Education" (CT2A7.5). Discussion about task process was used by the members twice in two weeks (OC16.4, OC7.5). The members tended to focus on topics and to elaborate on their meaning. For instance, Tareq oriented the group to a trend as he listed some positives and negatives of using mobile learning. He stated:

Mobile learning has positives and negatives like any other tools. Its positives are that its ability to promote interaction with students each other and with the teacher in interesting way, and this can happen to a large number of students. On the other hand, its negatives are that the lack of data storage, programs and security compared to computers (CT2A7.5).

Confirmation or agreement statements were used once in week 11 (OC7.5). This statement was utilised to confirm the topic and sub-topics of the group's task. For example, Zahed stated "I agree with Tareq to select mobile learning as a topic of our work, and to include its positives and negatives as well as the rationale of the use of mobile learning" (CT2A7.5). In addition, a social statement was used once by a member in week 8 (OC16.4). In this example, Tareq used the Islamic statement "As-Salamu Alaykum" for greeting, then he commenced to define the task and draw the group members' attention to the use of mobile learning (CT2A16.4).

Group's final product

The group members submitted 530 words in the Bb system on the due date (week 11). Their plan was to produce a video file including the topics they discussed in the discussion forum. They selected mobile learning as their topic, supported by other sub-topics such as definitions of mobile learning, the positives and negatives of mobile learning, the rationale of the use of mobile learning, and the applications of mobile phones in Education. The group members submitted their task in the Bb system on the due date (week 13). They produced a video file which consisted of all the topics they discussed in their online discussions (CT2B21.5). This indicates that the group's work was directly reflected in their final product. These students defined mobile learning and how this can be used in Education with the inclusion of some applications. They also described the rationale of the use of mobile learning, and listed its positives and negatives as was discussed in the discussion forum. Therefore, this group received a good mark due to the strong relation of their task to the online discussions' content.

Social/ Cultural issues

Tareq seemed to be the most active member or the leader who initiated the group's work. He defined the task to his group and encouraged his peers to participate. He attempted to steer the group in a direction by providing a definition of mobile learning as he stated "The use of mobile phone in Education is very important and it is called mobile learning" (CT2A16.4). Following this, he suggested to include different topics such as positives and negatives of mobile learning, the rationale of the use of mobile learning, and the applications of mobile learning (CT2A23.4, CT2A30.4). After this, he attempted to orient the group based on his suggestions, so he listed some positives and negatives of mobile learning as he stated "Each technology tool in Education has both sides positives and negatives" (CT2A23.4).

Zahed was a less active member. He agreed with Tareq's selection of mobile learning and he responded to this by providing additional information about the topics as he stated "we need to include definition of mobile learning, positives and negatives, and the rationale of the use of mobile learning. These topics make our product strong and connected" (CT2A7.5). Mosab was the least active member. He tended to support his group by suggesting organising the group work based on the topics discussed in the online discussions. He stated "I suggest to organise these topics we discussed and finalise our product as soon as possible before the due date" (CT2A7.5). Based on the students' contributions, this group had unequal participation levels. This emerged as two members participated to develop the task by suggesting alternatives. One member oriented the group to the process and one member also defined the task.

Students' interaction with the teacher

The discussion forum transcripts show that only one student responded to the teacher's question "What is educational communication?" in one response (OC30.4). In this instance, Tareq explained educational communication based on his understanding. He stated:

It is the way of communication between sender and receiver where the sender (teacher) is skilled and able to maintain the aims of educational messages for the present and future, whereas the receiver (student) has positive impression to obtain these messages that are meaningful (CT2A30..4).

It was expected that this question will help the group members understand diverse issues relevant to synchronous and asynchronous tools in Education that allow them to create their final product. However, it appeared that this sole interaction was not directly reflected in the group's task.

2. Email tool

Students' interaction with others and with the teacher

The email transcripts show that none of these group members used the email tool for interaction to complete Task 2 from week 8 to week 11 (ET16.4, ET23.4, ET30.4, ET7.5).

3. Chat tool

Students' interaction with others and with the teacher

The chat tool transcripts show that only one student (Tareq) used the chat session in week 11 (CT7.5). This student discussed their topics with other group members and with the teacher, and he asked for suggestions on his group's work.

4. Journal tool

Students' interaction with others and with the teacher

None of these group members used this tool to reflect on their own learning or the subject content from week 8 to week 11 (JT16.4, JT23.4, JT30.4, JT7.5).

Technical issues/ contextual factors

None of these group members reported any technical issues or other contextual factors that could support or restrict the group' work and interaction to complete Task 2 (JT16.4, JT23.4, JT30.4, JT7.5, SPOI29.5).

Summary

All three members used the discussion forum and met the task requirements. In this task, the participation levels were uneven, as they were in Task 1. Individual roles were defined based on students' participations to complete the task as they were in Task 1 (Tareq was the most active member, Zahed was less active, and Mosab was the least active). Only one member interacted with the teacher's question posted for the task, and only one member used the chat tool. None of these group members used the email tool. The group members' collaboration was generally successful because the students met the task requirements, and they received a good mark because of the strong relation of their task's content to their online discussions' content. It was expected that these students would collaborate more than in only two weeks out of four.

Group E/Task 1

Students' background

Gameel, Yaser and Saad were the next group members. They came from different small towns around the city and they travelled daily by car to attend their classes at KFU (SPI6.3). Gameel and Saad reported that they live in large families of six to ten members. Yaser reported that he lives in a family of three to five members (SPI6.3). Gameel and Yaser reported that their parents have Bachelor's degrees. Saad reported that his father has a low level of education (SPI6.3). Gameel and Saad reported that their parents work in the private sector with high monthly incomes. Yaser reported that his father works in a governmental sector with a high monthly income (SPI6.3).

The group members reported face-to-face instruction in high school and at the university (SPI6.3). Gameel and Yaser reported that they have PCs and Internet access at home, and reported using the Internet for about ten hours a week for general browsing, checking emails, and participating in public discussion forums. Saad reported that he has a shared computer with Internet access at home. He reported using the Internet for about five hours a week for general browsing and checking emails (SPI6.3). None of these students reported having used the Internet for learning or educational purposes (SPI6.3).

1. Discussion forum

Students' interaction

All three group members used this tool for the online discussions, and they are coded at the sentence level (task process, confirmation, suggestion and social statement) from week 3 to week 7. Table 5.9 shows the frequencies of these codes derived from the group interactions in the discussion forum.

Table 5.9 Frequencies of the codes based on the group members interactions.

Week	Student	Codes	Frequency 'N'
3	Gameel	Task process Suggestion Confirmation "agreement" Social statement	1 0 0 0
3	Yaser	Task process Suggestion Confirmation "agreement" Social statement	0 0 0 0
3	Saad	Task process Suggestion Confirmation "agreement" Social statement	0 0 0 0
4	Gameel	Task process Suggestion Confirmation "agreement" Social statement	1 0 0 1
4	Yaser	Task process Suggestion Confirmation "agreement" Social statement	1 0 1 1
4	Saad	Task process Suggestion Confirmation "agreement" Social statement	0 0 1 1
6	Gameel	Task process Suggestion Confirmation "agreement" Social statement	0 0 0 0
6	Yaser	Task process Suggestion Confirmation "agreement" Social statement	1 0 0 2
6	Saad	Task process Suggestion Confirmation "agreement" Social statement	0 0 0 0
7	Gameel	Task process Suggestion Confirmation "agreement" Social statement	0 1 0 0
7	Yaser	Task process Suggestion Confirmation "agreement" Social statement	0 1 0 0
7	Saad	Task process Suggestion	0 1

		Confirmation "agreement"	0
		Social statement	0

Note.

1. Task definition: Relates to the way of how the group members understand the task and identify the topic.
2. Task process: Relates to how the group members keep the group on track.
3. Suggestion: Relates to how the group members suggest alternatives and solutions to develop the task.
4. Confirmation "agreement": Relates to the statements include "Yes" or "agree", or consist of any agreement in any other way.
5. Social statement: Relates to any statement that is not relevant to the decision task.

From online observations, social statements appeared to be the most frequent activity (n=5, over five weeks), followed by discussion about task process (n=4, over five weeks). In this group, all three members used social statements including greeting and words of thanks to support each other adding topics and elaborating on them in order to finalise the group work. For example, Gameel and Yaser commenced their discussions (week 4 and week 6) with greeting statements, and then they gave thanks to their peers for their interactions in order to complete the task (CT1A17.3, CT1A2.4). Gameel stated:

Thanks guys for your interactions. We look forward to seeing more topics in our discussions. It is possible to review a variety of topics and discuss them openly, then we can identify some of the topics relevant and important as perceived by the members (CT1A17.3).

Discussion about the task process was used by two members (Gameel & Yaser) in order to steer the group. These members provided information and elaborated on the topics of reasons for using technology in Education, and examples of the use of technology tools in Education and their advantages in the learning process. In this case, Gameel attempted to focus on the examples of technology tools in Education, and he stressed on computer software. He stated:

Presenting examples of technology tools and their advantages gives the main idea of the reasons for the use of technology in the classroom. PowerPoint

program, as example, has great advantages in the learning process, especially to draw the students' attention (CT1A17.3).

In addition, Yaser listed other examples such as "overhead projectors, laptop computers and Smart Boards", and he stated "This enables us to deeply understand the topic" (CT1A17.3). Suggestion statements were used three times by all three members in one week to develop the task (OC9.4). For example, the students suggested including descriptions of technology tools, the importance of technology tools, the rationale of the use of technology in Education, and the effectiveness of the use of technology in Education. In addition, Yaser suggested including pictures to support their work (CT1B9.4).

Confirmation or agreement statements were the least frequent activity, with these recorded twice in one week (OC17.3). For instance, Saad agreed with Gameel to stress on the reasons for using technology in Education and he reported "reasons for using technology are the key elements of our work" (CT1A17.3). In another case, Yaser agreed with Gameel to focus on computer software as examples of technology tools in Education.

Group's final product

These group members submitted 510 words in the Bb system on the due date (week 6). Their plan was to create a website including the topics discussed in the online discussions. These topics were the reasons for using technology in Education, and examples of technology tools and their advantages in the learning process.

This group submitted a website in the Bb system on the due date (week 8). These group members created their website including the two topics discussed in the discussion forum (CT1B16.4). They also included another topic (the benefits of the use of technology for both teachers and students) which was not discussed in the online discussions. This indicates that the group members' work was not reflected in

their final product. On the group's website, the students listed the reasons for the use of technology in Education, and they reviewed examples of technology tools and their advantages as discussed in the discussion forum. They also described the benefits of the use of technology for both teachers and students which were not discussed in the discussion forum. It seemed that there was a lack of detail in their final product and ideas were separate and not connected. Thus, this group received an average mark because of the lack of relation of the task's content to the online discussions' content.

Social/ Cultural issues

In this group, there was a competition between two members (Gameel and Yaser) to encourage the group members, keep the group on track, and develop the task. The individual roles of the two students were not clearly defined as they shared the roles and supported the group's work by providing information about topics and elaborating on them, and suggesting alternatives and solutions to finalise their product. For example, these two students shared words of thanks to support each other (CT1A17.3). For example, Yaser stated "Thank you all for your responses. We need to support each other until we submit our work" (CT1A17.3). In another case, Gameel stated "Thanks guys for your interactions. We look forward to seeing more topics in our discussions" (CT1A17.3). This kind of support led the students to initiate elaborating on the topics and not neglecting task definition at the commencement of the discussions. In addition, they shared ideas to provide information about specific topics to be included in their final product. For instance, Gameel provided information about the reasons for using technology in Education, such as the need of learning development and improvement of students' skills. He also focused on the examples of technology tools in Education such as computer software (CT1A12.3, CT1A17.3).

Yaser listed other examples of technology tools such as overhead projectors, laptops, and Smart Boards (CT1A17.3). He attempted to encourage his peers and steer the

group as he stated "We are too late, we should decide what topics we need to include in our work" (CT1A2.4). Moreover, these two students developed the task by suggesting alternatives. For example, Gameel suggested including the effectiveness of the use of technology in Education and he asked the group members to think about it (CT1A9.4). Yaser suggested including pictures to support the group's work (CT1B9.4). In this group, Saad appeared to be the least active member as he only used one suggestion in the online discussions. He attempted to develop the task process by suggesting the following topics: Description of technology tools, the importance of technology tools, and the rationale of the use of technology in Education (CT1A9.4).

This group had uneven participation levels. The three group members used social statements, but Gameel and Yaser used them for encouragement. The three members also shared suggestion statements to develop the task. Gameel and Yaser attempted to orient the group to the task process. In addition, it appeared that there was a lack of interaction between the group members as the actual online discussions occurred in two weeks only (OC17.3, OC9.4). This could be attributed to the technical issues or other contextual factors that will be described later.

Students' interaction with the teacher

The group members posted 12 responses in the discussion forum to respond to the teacher's questions (OC12.3, OC17.3, OC26.3, OC2.4). There were five postings from the three group members in response to the first question "What do you know about technology in Education?". Those students attempted to determine their understanding about which ways technology in Education is different from traditional learning. For example, one student defined technology in Education as "programs and tools that help to educate people in better way than traditional learning" (DT12.3). Another student defined it as "developed programs that can be implemented to enhance the learning process and not, is the case in traditional learning which has a durable style" (DT12.3).

Two students responded to the second question "What are technology tools?". Those students reported that "technology tools are resources that support the teacher as he/she designs, develops and delivers educational materials" (DT17.3). One student responded to the question "Why do we use technology tools?". He reported that "technology tools increase the students' motivation to learning" (DT26.3). In addition, the three group members responded to the question "What are the norms of technology tools selection?". Those students described that "technology tools are selected as they are consistent with the subject, the students' thoughts and experiences, and are able to be developed" (DT2.4). It appeared that these responses were similar to other responses from other groups. The students' interactions with the teacher were not directly reflected in their final product.

2. Email tool

Students' interaction with others and with the teacher

The email transcripts show that two members of this group used the email tool for interaction from week 3 to week 7. Yaser sent a message to the teacher inquiring about how to use the submission tool on the Bb system for the group's task as he found difficulties (ET17.3). He also sent another message to reflect on feedback he received from the teacher (ET26.3). Moreover, Saad sent a message of notice of absence as he was not able to attend a lecture (ET12.3). He also sent another message to the teacher inquiring about the chat session of week 5, and whether it had been organised or not (ET26.3). Although these messages were sent in the duration of Task 1, these emails did not contribute to the completion of the task.

3. Chat tool

Students' interaction with others and with the teacher

The chat tool transcripts show that two members (Gameel & Yaser) used the chat session in week 4 (CT17.3), the three members used it in week 5 (CT26.3) and that two students (Gameel & Yaser) used it in week 6 (CT2.4). These chat sessions were organised by the teacher to discuss the requirements of Task 1. Those students interacted with the teacher and with other group members. They discussed their topics with the others and asked for suggestions.

4. Journal tool

Students' interaction with others and with the teacher

In this group, two members (Gameel & Yaser) used this tool to reflect on their own collaborative learning environment in 11 postings over five weeks (OC12.3, OC17.3, OC26.3, OC2.4, OC9.4). Those students reported that collaborative learning environments were worthwhile opportunities to share thoughts and experiences (JT12.3). In addition, the three group members reflected on the limitations of completion of Task 1. For example, Gameel and Yaser reported that poor air conditioning and difficulties in computer access in the computer lab restricted the completion of the task (JT26.3, JT2.4, JT9.4). Saad reported that difficulties in communication with the other members due to a lack of harmony constrained the completion of the task (JT26.3).

Technical issues/ contextual factors

In this section, the technical or contextual factors that could support or inhibit the use of technology and collaboration are described. In this group, Gameel and Yaser reported that poor air conditioning and difficulties in computer access in the

computer lab were the factors that limited the completion of Task 1 (JT26.3, JT2.4, JT9.4, SII10.4). Saad reported that there were difficulties in communication with other members because of a lack of harmony (JT26.3). This might arise because these students came from different towns. It could also be that these students did not know each other and that they have not studied with each other before this subject.

Summary

All three students collaborated in the discussion forum and met the requirements of the task. The students' contributions were not clearly defined as there was competition between two members. Gameel and Yaser attempted to guide the group by providing information and suggesting solutions to develop the task. Saad appeared to be the least active member as he only attempted to develop the task by suggesting some alternatives. This group had uneven participation levels. The group's work was oriented and encouraged by two members. All three members interacted with the teacher's questions posted for the task and used the chat sessions. Two members used the email tool.

Although this group received an average evaluation mark, the students' collaboration was successful overall because the group members met the task requirements. They reflected on their collaborative learning environments as worthwhile opportunities to share thoughts and experiences (JT12.3). It was expected that these student would collaborate more. Online discussions were recorded in only two weeks out of five. This could refer to the restrictions that the students reported such as a lack of Internet and computer access in the computer lab or the difficulties in communication with the members due to a lack of harmony.

Group E/Task 2

1. Discussion forum

Students' interaction

The group members' online discussions were coded at the sentence level (task definition, task process, confirmation, suggestion and disagreement) from week 8 to week 11. These codes indicate the decision functions that the group took to reach their final product. Table 5.10 shows the frequencies of these codes derived from the group interactions in the discussion forum.

Table 5.10 Frequencies of the codes based on the group members interactions.

Week	Student	Codes	Frequency 'N'
10	Gameel	Task definition	1
		Task process	1
		Suggestion	0
		Confirmation "agreement"	0
		Disagreement	0
10	Yaser	Task definition	0
		Task process	1
		Suggestion	0
		Confirmation "agreement"	1
		Disagreement	0
10	Saad	Task definition	0
		Task process	1
		Suggestion	0
		Confirmation "agreement"	1
		Disagreement	0
11	Gameel	Task definition	0
		Task process	0
		Suggestion	1
		Confirmation "agreement"	0
		Disagreement	0
11	Yaser	Task definition	0
		Task process	1
		Suggestion	1
		Confirmation "agreement"	0
		Disagreement	0
11	Saad	Task definition	0
		Task process	0
		Suggestion	1

		Confirmation "agreement"	0
		Disagreement	1

Note.

1. Task definition: Relates to the way of how the group members understand the task and identify the topic.
2. Task process: Relates to how the group members keep the group on track.
3. Suggestion: Relates to how the group members suggest alternatives and solutions to develop the task.
4. Confirmation "agreement": Relates to the statements include "Yes" or "agree", or consist of any agreement in any other way.

Based on online observations, the task was defined only once by a member in week 10 (OC30.4). For example, Gameel defined the task to his group members and attempted to draw their attention to the topic as he stated:

No group selected discussion forum. It is a good opportunity for us to take it guys. Discussion forum is asynchronous tool for learning and it can be used for open dialogue between teachers and students. I think we need this kind of tool to support our learning (CT2A30.4).

Discussion about task process was used by the members four times in two weeks (OC30.4, OC7.5). The members endeavoured to steer the group by focusing on the topics and providing additional information about them in order to keep the group on track. For instance, Saad provided additional information about the discussion forum as a learning tool. He stated:

It is a learning tool that allows educational discussions between students with each other and with the teacher, regardless of time and place which is one of the most important features of the discussion forum. It is suitable for only adult students (CT2A7.5).

Yaser attempted to keep the group on track by providing focused information on the use of discussion forum in Education. He stated:

It is an appropriate learning tool for indirect interaction between teachers and students. This tool allows students and teachers posting and responding to each other at any time (CT2A30.4).

Suggestions involving the advantages and disadvantages of discussion forums as learning tools, and the applications of discussion forums in Education were used by the members to develop the task (CT2A7.5). These suggestions were recorded three times in one week (OC7.5). For example, Yaser attempted to develop the task by suggesting to include the advantages and disadvantages of discussion forums as a learning tool. He stated:

One of the important advantages of discussion forum is that the learner has the opportunity to participate in the learning process with the teacher, regardless of time and place. On the other hand, the most considerable disadvantage of this tool is a lack of the Internet access at home for some students (CT2A7.5).

Another example, Gameel stated:

I suggest including the advantages and disadvantages of discussion forum with more focused information about the use of this tool as a learning tool, I mean in 'educational field' (CT2A7.5).

Confirmation or agreement statements were used twice in week 10 (OC30.4). This statement was used to confirm the topic of the group's task. For example, Yaser stated "I agree with Gameel's concept to select discussion forum as a topic of our product" (CT2A30.4). A disagreement statement was used once in week 11 (OC7.5). This statement was used by a member to disagree with a suggestion. In this instance, Saad stated "I disagree with Yaser's suggestion to concentrate on the applications of discussion forum as learning tool for our work. I suggest to concentrate on its advantages and disadvantages" (CT2A7.5).

Group's final product

The group members submitted 515 words in the Bb system on the due date (week 11). Their plan was to produce an audio file containing the topics they discussed in the discussion forum. They selected discussion forums as a learning tool for their task. They also discussed other issues to support the main topic such as a definition

of discussion forums in Education, and the advantages and disadvantages of discussion forums as a learning tool. The group members submitted their final product in the Bb system on the due date (week 13). These members created an audio file including the topics they planned and discussed in their online discussions as described. Moreover, they focused on the importance of the use of discussion forums in Education which was not discussed in the discussion forum on the Bb system. This shows that the group's work was not directly reflected in the final product. Thus this group received an average mark because of the lack of relation of the task's content to the online discussions' content.

Social/ Cultural issues

There was competition between two members (Gameel and Yaser) to encourage the group to participate in order to complete Task 2 as they did in Task 1. The individual roles of the two students were not clearly defined as they supported the group's work by providing information about topics and suggesting alternatives to finalise their task. For instance, Gameel defined the task and drew his peers' attention to the topic, then he provided information about using discussion forums in Education as he stated "Discussion forum is asynchronous tool for learning and it can be used for open dialogue between teachers and students" (CT2A30.4). In addition, Yaser provided another definition of using discussion forums in Education to keep the group on track as he stated "it is an appropriate learning tool for indirect interaction between teachers and students. This tool allows students and teachers to post and respond to each other at any time" (CT2A30.4).

These two students developed the task by suggesting alternatives. For example, Gameel suggested including discussion forums as a learning tool including advantages and disadvantages. At this point, Yaser responded to this suggestion and he listed one advantage "the learner has the opportunity to participate in the learning process with the teacher, regardless of time and place" (CT2A7.5), and one disadvantage " a lack of the Internet access at home for some students" (CT2A7.5).

Saad seemed to be the least active member. His actual participation was to provide another definition of using discussion forums in Education as he stated "It is a learning tool that allows educational discussions between students with each other and with the teacher" (CT2A7.5)... "It is suitable for only adult students" (CT2A7.5). Based on the students' contributions, this group had relatively equal participation levels as all three group members participated to steer the group and develop the task by suggesting alternatives. However, only one member defined the task.

Students' interaction with the teacher

The discussion forum transcripts indicate that none of these group members interacted with the teacher's question posted for the task (DT16.4, DT23.4, DT30.4, DT7.5). It was expected that this question would help the students think about the topic of the task and understand diverse issues related to synchronous and asynchronous tools in Education.

2. Email tool

Students' interaction with others and with the teacher

None of these group members used the email tool for interaction to complete Task 2 from week 8 to week 11 (ET16.4, ET23.4, ET30.4, ET7.5).

3. Chat tool

Students' interaction with others and with the teacher

The chat tool transcripts indicate that none of these group members used any of the chat sessions organised by the teacher from week 8 to week 11. These chat sessions were set to discuss the requirements of Task 2 (CT16.4, CT23.4, CT30.4, CT7.5).

4. Journal tool

Students' interaction with others and with the teacher

In this group, two members (Gameel & Yaser) used this tool to reflect on the limitations of completion of Task 2 in two responses (OC23.4, OC7.5). These two students reported that the lack of Internet and computer access in the computer lab affected the group's work to complete the task (JT23.4, JT7.5).

Technical issues/ contextual factors

In this group, two student (Gameel & Yaser) reported that the lack of Internet and computer access in the computer lab restricted the group's work and the members' interactions to complete Task 2 (JT23.4, JT7.5, SPOI29.5).

Summary

All three members used the discussion forum and met the task requirements. In this task, the participation levels were relatively equal as they were in Task 1. The group members attempted to steer the group to the task and suggested alternatives to develop the task. Individual roles were not clearly defined as exactly as they were in Task 1. The group members supported each other to complete the task (Gameel and Yaser were competitors, and Saad was the least active member). The results indicated that none of these group members interacted with the teacher's question posted for Task 2, or used the email or chat tools. The group members' collaboration was generally successful because the group members met the requirements of the task. It was expected that these students would collaborate more. They only interacted in two weeks. This could be attributed to the limitations that the members reported such as the lack of Internet and computer access in the computer lab.

The next chapter reports the findings of the students' responses in the online tools, and their cultural and social backgrounds collected from an illustrative group in the second iteration.

Chapter 6

Findings: Iteration 2

Introduction

The participants of the second iteration were a new cohort of fifteen education students in the same first year IT class at KFU in Saudi Arabia. The subject was *"Producing and Using Instructional Tools"*. The students were required to complete the same two collaborative tasks within groups in the same way as in the first iteration. The first task required students to create a website about using technology in Education. The second task required students to create a podcast about using synchronous/asynchronous tools in Education, or a video narrative about using mobile phones in Education (see Appendix 3).

In view of the findings from the first iteration, some changes were made to the task requirements and levels of teacher support. In this chapter, the second iteration of data collection is described and particular emphasis is given to collaborative group roles, student interpretations of the task, and enhanced communication amongst group members. Following this, a discussion of the findings for each of the three focus areas is presented.

The collaborative group roles section describes the students' collaboration in the second iteration, their interaction patterns in the online tools, and the roles they took to finalise their tasks. The students' interpretations of the task demonstrate the students' understandings of the tasks in the online tools, and their ability to make meaning and construct knowledge. The "Issues of communication" section presents teacher expectations of the tasks, students' communication with the teacher and with other group members through the online tools, and cultural or contextual factors that could affect their communication. Group E was used as an illustrative group to explicate the findings for these areas. This group had three members (Adham, Asem

& Talal) and was selected because the group members' work was reflected in their tasks.

The student participants were observed and interviewed. The observations were used to examine the students' interaction in the online learning environment within their completion of the tasks. In addition, each student participated in three 20 minute interviews with the Research Assistant who conducted the interviews, and marked students' assignments and exams (as students were in a dependent relationship with the researcher as a teacher over fifteen weeks of the regular semester). These interviews were to investigate students' cultural/social backgrounds, beliefs regarding technology, personal factors that impact the use of technology, and to explore problems that students have faced within their use of technology and collaboration. Other data sources such as work samples from the groups' websites and audio files were also analysed and used to interpret the findings.

Group E

This group was selected to illustrate the three focus areas (collaborative group roles, student interpretations of the tasks, and issues of communication) due to the considerable relation of the group's online discussions to their submitted tasks (CT1B19.11, CT2B24.12).

Students' background

This group had three members (Adham, Asem & Talal) who established their own group in the orientation weeks. They assigned a group leader (Adham) and the teacher/I was informed (RJ12.11). The preliminary interviews were conducted with the group members to investigate their cultural and social background, their beliefs, and personal factors that affect their use of technology and collaboration. The group members came from a small town around the city (SPI4.10). They identified that

they live in large families of six to ten members and their parents have low levels of education (less than a high school degree) (SPI4.10). All the group members identified that their parents work in governmental sectors with average monthly incomes, which means it is hard to provide necessary living conditions for the all family members (SPI4.10).

The group members reported face-to-face instruction in high school and at the university; passive learners in the classroom (SPI4.10). All group members identified that they have their own PCs and Internet access at home (SPI4.10). They also all reported using the Internet more than ten hours a week for general browsing, checking emails, participating in public discussion forums, and maintaining personal Facebook accounts (SPI4.10). None of the group members reported having used the Internet for learning or educational purposes (SPI4.10).

Second iteration focus: Collaborative group roles

Due to the substantial relation of the group's online discussions to their tasks, it was expected that the group members adopted collaborative group roles in order to achieve their tasks. The following sections explain this matter in more detail.

The first iteration revealed a number of issues that were related to problems of supporting the groups' work throughout the process and having individual roles within the group. These issues were:

- Lack of timely feedback and collaboration (RJ16.4, RJ4.6) between the students from groups (C & E) to complete the collaborative task 1 (CT1A17.3, CT1A2.4, CT1A9.4) and collaborative task 2 (CT2A30.4, CT2A7.5).
- The collaborative roles within groups were not obviously distributed between the members such as dialogue leadership (RJ16.4, SII10.4), note

taking (RJ16.4, SII10.4), reporting (RJ4.6, SII10.4), providing resources (RJ4.6, SPOI29.5) and decision-making (RJ4.6, SPOI29.5).

In response to the issues revealed from the first iteration, inclusion of collaborative groups and subsequent roles such as group leadership in the second iteration were included. The student participants were encouraged to establish their own groups of three in the orientation weeks before the commencement of the session within which the second iteration took place. The groups were based on student friendships where roles become flexible and functional, and group effort is oriented to the task process.

Students' collaboration in the second iteration

There were some changes to the task requirements and levels of teacher support that were made in order to enhance student collaboration. Participants were:

- Urged to have collaborative roles to support their group work.
- Encouraged to provide their peers with feedback in the discussion forum.
- Required to use the discussion forum and chat tool at least five times each.
- Continuously observed by the teacher through the online tools.
- Encouraged to use the email and journal tools to contact the teacher and their peers, and to reflect on their own learning.

Below is more detail on the above points.

The students were encouraged to have their own collaborative roles and allocate them among the members in their groups. For example, each group was asked to assign a leader and keep the teacher informed. The group leader is supposed to provide feedback and direction, set achievable goals, identify problems, increase communication, and encourage participation. It was hoped that this method of grouping would enable students who share a mutual objective to work together in order to complete the collaborative tasks.

In addition, the students were encouraged to provide other members in their groups with timely and continuous feedback in the discussion forum on their responses, and to virtually discuss the topics of their final products with other group members and gain suggestions on their work in the weekly chat sessions. They were required to participate in five chat sessions at minimum to discuss the task specifications and barriers. Furthermore, the groups were constantly observed via the online tools (discussion forum, email, chat and journal tools) and provided with required assistance by the teacher such as answering their questions and giving feedback on their posts in the discussion forum.

The teacher attempted to support the students by posting (three-four) questions (e.g. Why?, How?, When?) weekly in the discussion forum to help the groups discuss their tasks, increasing responses and feedback on the students' replies of the tasks to enhance group work, and sending reminders to their emails on Blackboard (Bb) to foster them interacting their colleagues via the online tools.

The student participants were required to discuss the two collaborative tasks with other group members in the discussion forum a minimum of five times for each member, and each post must contain at least 100 words (see Appendix 3). They were also required to participate in the chat tool with their peers and with the teacher for an hour each week, and each student was required to participate in five chat sessions at minimum over the semester (fifteen weeks) to discuss the requirements and difficulties of these tasks. They were also encouraged to use the email tool to communicate with each other and to contact the teacher if they have any questions about the subject, and to use the journal tool to reflect on their learning after class each week. The following sections describe the students' collaboration via the online tools to complete the collaborative tasks.

Group E/Task 1

Students' interactions (discussion forum)

The first task required students to create a website about using technology in Education. The discussion forum was designed to facilitate asynchronous interactions between the students in their groups and between the students and the teacher in an online learning environment. The students were required to use this tool to collaborate with their peers to complete the two collaborative tasks. In this task, all group members used this tool and their online discussions were coded at the sentence level into categories (task definition, task process, suggestion and confirmation; the full transcripts for both tasks, see Appendix 6). These categories indicated the decision-making process that the group took to reach their final decision to complete the task from week 3 to week 7. Table 6.1 shows the frequencies of these categories derived from the group interactions in the discussion forum.

Table 6.1 Frequencies of the categories based on the group members interactions.

Week	Student	Codes	Frequency 'N'
5	Adham	Task definition	0
		Task process	3
		Suggestion	3
		Confirmation "agreement"	1
5	Asem	Task definition	1
		Task process	2
		Suggestion	1
		Confirmation "agreement"	1
6	Talal	Task definition	0
		Task process	0
		Suggestion	1
		Confirmation "agreement"	1

Note.

1. Task definition: Relates to the way of how the group members understand the task and identify the topic.
2. Task process: Relates to how the group members keep the group on track.

3. Suggestion: Relates to how the group members suggest alternatives and solutions to develop the task.
4. Confirmation "agreement": Relates to the statements include "Yes" or "agree", or consist of any agreement in any other way.

Table 6.1 shows that the students' discussions were recorded in three weeks (OC29.10, OC5.11). This group appeared to have unequal participation levels (task process $n=5$, suggestion $n=5$, confirmation "agreement" $n=3$, task definition $n=1$) amongst the members as only two members (Adham & Asem) evidently interacted in the discussion forum to complete the task. Despite this, the group's work was directly reflected in the final task, although there was lack of students' collaboration in the discussion forum to support the group work as the members interacted in only two weeks from week 3 to week 7 (OC29.10, OC5.11). It also seemed that there were incomplete conversations between the students in the online discussions (DT29.10, DT5.11).

From the discussion forum data (see Appendix 6), this task was defined only once by one member (Asem) in week 5 (OC29.10) (Post 1). Discussion about task process was used by two members (Asem & Adham) five times in one week (OC29.10). These members tended to keep the group on track by focusing on providing information about the term of technology in Education, the reasons for using technology in Education and the examples of technological tools in Education (CT1A29.10) (Posts 3, 5, 9, 11, &12). In addition, the group members suggestions included the rationale for using technology in Education, the advantages and disadvantages of using technology in Education for both teachers and students, and different examples of using technological tools in Education (CT1A29.10, CT1A5.11) (Posts 4, 7, 8, 10, &14). These suggestions were raised by the group members five times in two weeks (OC29.10, OC5.11). The group members also used confirmation or agreement statements three times in two weeks (OC29.10, OC5.11) (Posts 2, 6 &13) as task definition, task process, and suggestions were agreed upon.

In the discussion forum, Asem initiated the task and drew his peers' attention to the topic by defining the term of technology in Education. He stated:

We should know what technology in Education means. We need to define the term of technology in Education and how this can be used. I think this will be a good way for us to start with the definition which leads us to the related topics (CT1A29.10), (Post 1).

Adham agreed with Asem as he stated "I agree with Asem to define the term of technology in Education and how it can be used" (CT1A29.10), (Post 2) and then, he attempted to steer the group by elaborating on the term of technology in Education as he stated:

The term of technology in Education has a wide meaning. This term could include the tools that are used in the classroom by the teacher. It also could include the teaching methods that are implemented or it could involve the way of communication between the teacher and students (CT1A29.10), (Post 3).

After this, Asem continued to orient the group by providing information about the task as he listed some reasons for using technology in Education by stating:

The use of technology in Education enhances the all elements of the learning process including teachers, students, teaching methods, the subject, the learning materials and the learning environment (CT1A29.10), (Post 9).

Adham as the group leader attempted to steer the group and keep the group on track by suggesting alternatives and providing different examples of technological tools in Education. He stated:

I suggest including some challenges of using technology in Education and different examples of technology tools in Education (CT1A29.10), (Posts 8 &10). The inclusion of different examples of technological tools such as visual or audio tools in our work is useful to clarify in which way the technology can be applied to improve students' skills in the learning environment (CT1A29.10), (Post 11).

In addition, Asem listed other examples of technological tools in Education in order to keep the group on track by discussing task process as he stated "Desktop computers, laptops, mobile learning, social network tools....etc are significant for both teachers and students" (CT1A29.10), (Post 12). The group leader (Adham) attempted to develop the task process by suggesting alternatives. He stated:

We should also know what the rationale for using technology in Education is (Post 4). I suggest to include this topic because this will assist us to identify the use of technology in Education and then link it to other topics such as the advantages and disadvantages of using technology and the examples of technological tools (CT1A29.10), (Post 5).

Following this, Asem agreed with Adham as he stated "I agree with Adham to stress on the rationale for using technology in Education" (CT1A29.10), (Post 6) and he wanted to develop the task by suggesting alternatives. He stated:

I think it is important to include the advantages and disadvantages of using technology in Education. This topic will give us an opportunity to examine a variety of experiences for both teachers and students which is very significant in the learning process (CT1A29.10), (Post 7).

Talal agreed with his peers as he stated "I agree with you guys to include the rationale for using technology in Education, the advantages and disadvantages of using technology in Education for both teachers and students" (CT1A5.11), (Post 13). He also contributed to the task by suggesting alternatives as he stated "I suggest to include one example of using technological tool in Education such as a visual tool instead of different examples" (CT1A5.11), (Post 14). The following sections describe the students' interactions with each other and with the teacher via the online tools (discussion forum, email tool, chat tool, and journal tool).

Students' interaction with the teacher (discussion forum)

The group members were encouraged to respond to the teacher's questions posed in the discussion forum after the lecture each week and during their interactions with

each other. These questions were related to the lectures which covered a variety of topics on technological tools and ICT in teaching, and were provided to assist the group members to think about the topic of Task 1. A different question was asked each week from week 3 to week 6. These questions were:

- What do you know about technology in Education?
- What are the technological tools used in Education?
- Why do we use technological tools?
- What are the norms of using technological tools?

I encouraged the group members to respond to these questions during their interactions with each other within group to complete the task. Analysis showed that none of these group members interacted with the teacher's questions for Task 1 from week 3 to week 7 (DT15.10, DT22.10, DT29.10, DT5.11, DT12.11).

Students' interaction with others and with the teacher (Email tool)

The email tool was designed to enhance student learning in the online learning context. This tool was an elective asynchronous tool to be utilised for relevant discussions on the collaborative tasks. It was also designed to help the students contact the teacher for any questions or assistance. It was expected that the group members would use this tool to enhance their collaboration. They could use it to arrange a group meeting or appointment in order to discuss their task. It also could be used to circulate relevant information or important resources for their task. The email tool transcripts indicated that none of the group members used the email tool to complete Task 1 (ET15.10, ET22.10, ET29.10, ET5.11, ET12.11). Instead of emailing, the group members could have used other forms of communication such as mobile phones, social network websites, or face-to-face meetings.

Students' interaction with others and with the teacher (Chat tool)

The chat tool was designed to support student collaboration in the online learning environment. It was provided to allow synchronous interactions between the group members and with the teacher to discuss the requirements of the collaborative tasks or difficulties in completing the tasks. Each group member was required to participate in five chat sessions at minimum over fifteen weeks of the semester. The chat sessions were organised by the teacher for one hour each week. The group members were also encouraged to use this tool for group meetings.

The chat tool transcripts indicated that one student (Adham) participated in the week 4 chat session (CT22.10), one student (Asem) participated in the week 5 chat session (CT29.10), all three members participated in the week 6 chat session (CT5.11) and two students (Adham & Asem) participated in the week 7 chat session (CT12.11). These students discussed the requirements of Task 1 with the teacher and discussed their task topics with other group members (transcript, see Appendix 8). For example, Adham stated:

I have understood that every group members should participate in five responses related to the topic, and then these responses are arranged to be submitted with the assistance of the group leader (CT22.10), (Lines 5-8).

Asem added:

We decided to focus on the definition of the use of technology in Education on our website and we will discuss other related topics such as the reasons for using technology in Education, the advantages and disadvantages of using technology, and the examples of technological tools in Education. What do you think guys about this? (CT29.10), (Lines 10-16).

The group members asked their peers for suggestions and feedback. For instance, Adham stated "if you have other suggestions guys to improve our work, this will be appreciated, especially on the sub-topics" (CT5.11), (Lines 15-17). In addition, Asem added:

I would like to remind other group members that these areas or topics will be discussed in the discussion forum, which means all of you can see this. So, your feedback and comments are welcome (CT5.11), (Lines 20-24).

The students were required to participate in five chat sessions at minimum over fifteen weeks of the semester. Analysis indicated that these group members did not meet this requirement (CT22.10, CT29.10, CT5.11, CT12.11).

Students' interaction (Journal tool)

The journal tool was designed to promote student learning in the online learning environment. It was created to enable the group members to reflect on the content of the subject and their own learning. In this group, two members (Adham & Talal) used this tool to reflect on their own collaborative learning within their group work to complete Task 1 (OC22.10, OC29.10, OC5.11) (transcript, see Appendix 9). For instance, Talal reported that "The completion of tasks becomes much easier within group work" (JT22.10). Then he stated "Teamwork allows to understand the content of the subject and simplifies the requirements of the task" (JT29.10). Moreover, Adham reported that "Collaborative learning process assists us to understand the concept of the task and to finalise our product" (JT22.10). He identified "Collaborative learning environment encourages the members to complete the task without any boredom, and makes them more motivated" (JT29.10), and he added "Collaborative learning is useful for me, but I feel it is difficult sometimes to share all information that I have with my colleagues in the discussion forum" (JT5.11).

Group E's final product

In order to complete their task (creating a website), the students were required to submit 500 words in week 6 and then submit a website platform in week 8 based on their online discussions. The assessment criteria for this task (see Appendix 5) required the students to create a website using an appropriate design, to present the

group's topics, clarify expression and general presentation, and develop the ideas discussed in the discussion forum. In order to assist the students in designing their website, FrontPage software was suggested. This software is published by Microsoft and is easy to use for students as they do not need to learn scripting or other programming languages. I explained how to use it for their own task in week 3 of the second iteration for approximately 40 minutes in lecture time. Figure 6.1 shows the explanation of how to create a website using FrontPage software.

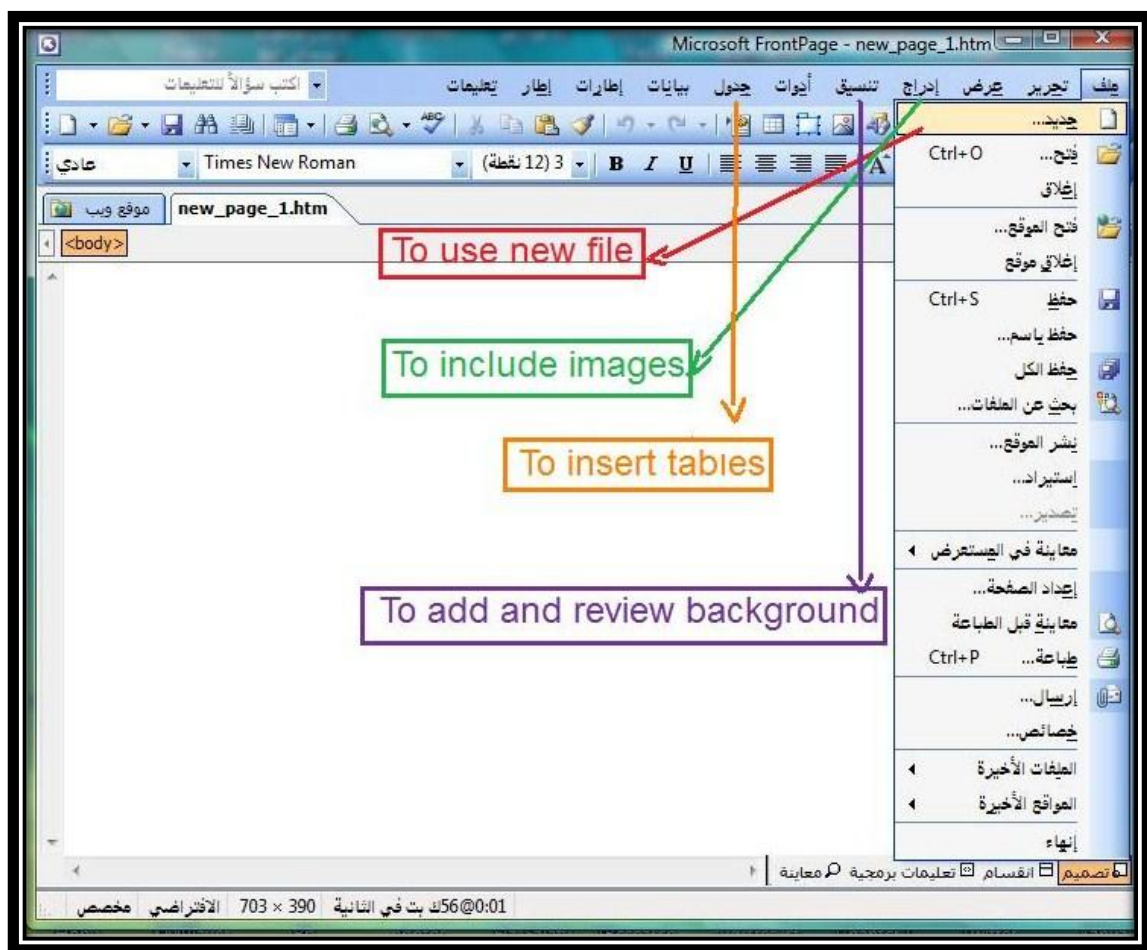


Figure 6.1- The teacher's description of how to create a website

This task was assessed based on the use of proper design with clarity of overall presentation to define the term of technology in Education through the group

members' discussion. After teacher support and explanation of how to design a website, it was expected that the students would be able to produce an appropriate design including text, images, necessary links, icons of explicit content, and developed discussion of ideas. The group members submitted their plan of 500 words in the Bb system. Analysis showed that these members organised their plan based on the topics in the discussion forum. They planned to define the term of technology in Education, provide the reasons for using technology in Education, describe the advantages and disadvantages of using technology in Education, and list different examples of technological tools in Education.

The group members created a website including all of the topics planned and discussed in the discussion forum (CT1B19.11). On the group's website, the students defined the use of technology in Education as various tools that could be implemented to support teaching, and it could be a teaching approach that might encourage students to learn. They stated:

The term of technology in Education can be defined as different tools that can be used to support teaching and learning process in several educational settings in order to accomplish the intended aims of learning. Furthermore, this term might refer to a method of teaching that is used by the teacher to motivate the learners to their learning as well as the subject in the learning process (CT1B19.11).

They provided some reasons for using technology in Education such as improving teachers and students' skills, and drawing the students' attention to the main topic of the subject. They stated:

The use of technology in Education is needed in the learning settings because of many reasons. One significant reason is that technology in Education can enhance teaching approach which helps students positively interact with the learning materials. It also helps improve teachers and students skills, and draws students' attention to the essential concept of the subject (CT1B19.11).

Figure 6.2 shows the group members discussions of the definition of the use of technology in Education and the reasons for using technology in Education on their website.

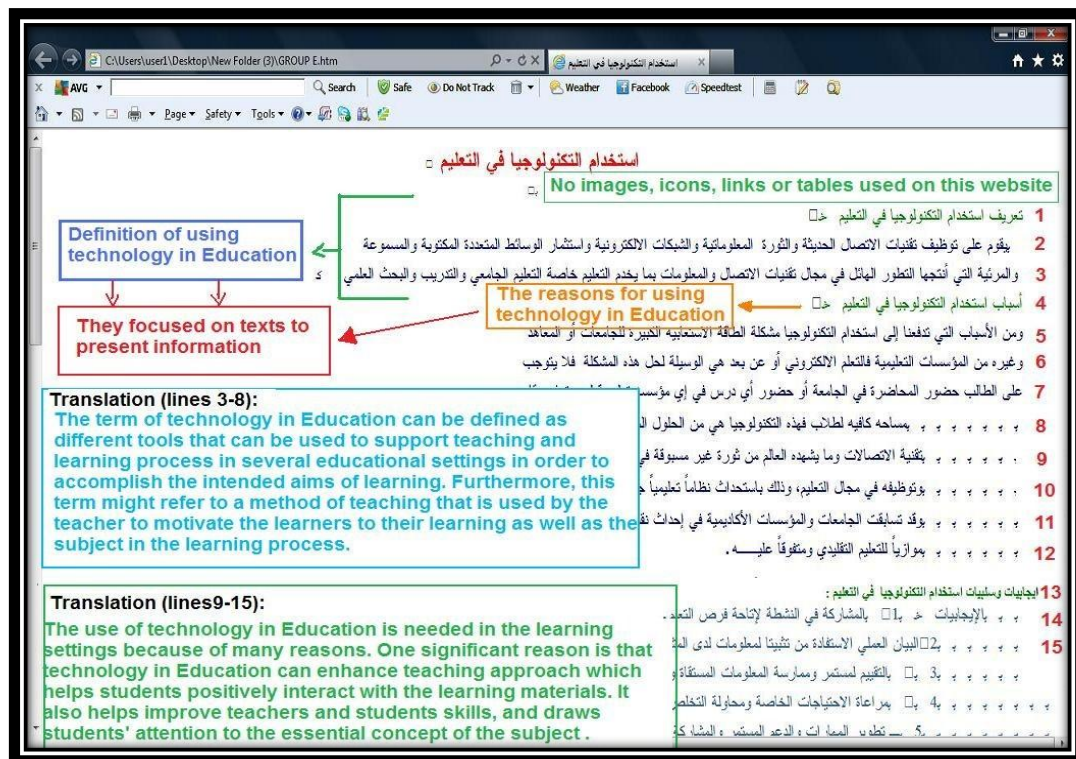


Figure 6.2- Definition of technology and its rationale on group E's website

In addition, they discussed the advantages and disadvantages of the use of technology in Education, such as developing students' cognitive skills and causing poor social communication skills due to lack of direct communication with the teacher. They stated:

The use of technology in Education encourages students to learn and develops their cognitive skills. It also improves teachers' performances in the learning environment within interesting way. However, it can cause isolation because of lack of direct communication between students and with their teacher (CT1B19.11).

Figure 6.3 shows the group members discussions of the advantages and disadvantages of using technology in Education on their website.

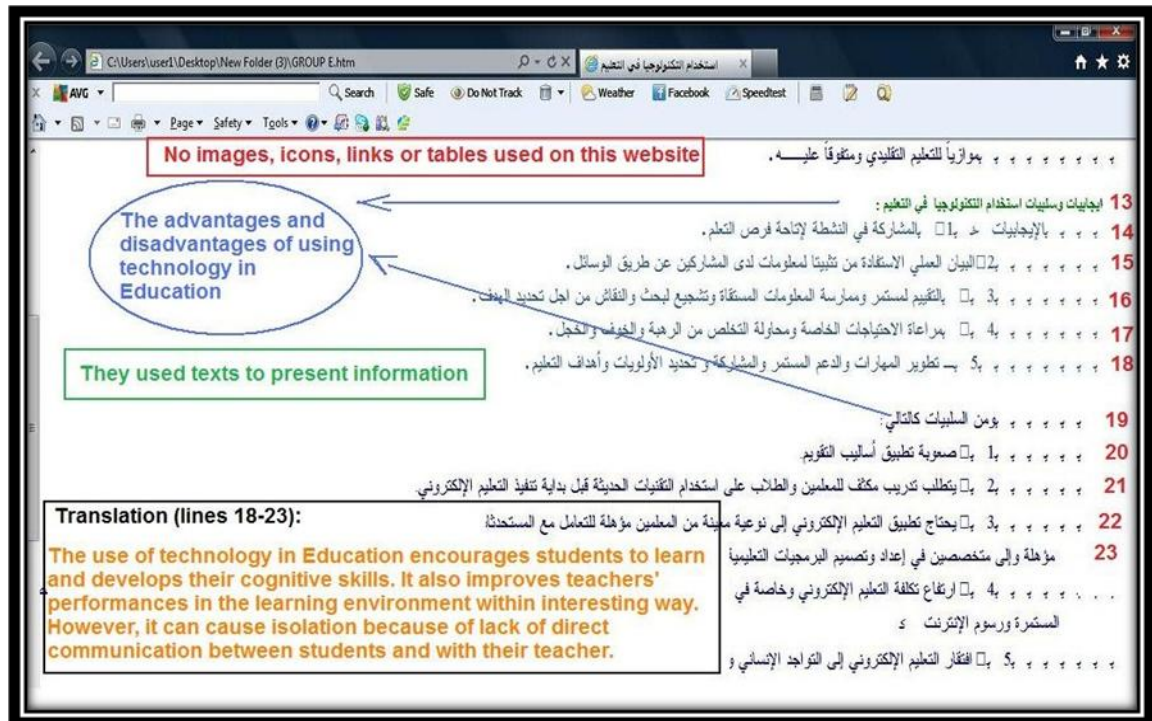


Figure 6.3- Advantages and disadvantages of technology on group E's website.

They also presented synchronous and asynchronous tools as examples of technological tools that can be used in Education. They stated:

The use of technological tools including synchronous and asynchronous tools such as computer, email and chatting or visual tools help students increase their interest to learn, and identify their individual differences and assist to treat them gradually in minimal effort and time in order to gain the desired skills (CT1B19.11).

Figure 6.4 shows the group members discussions of the examples of technological tools in Education on their website.

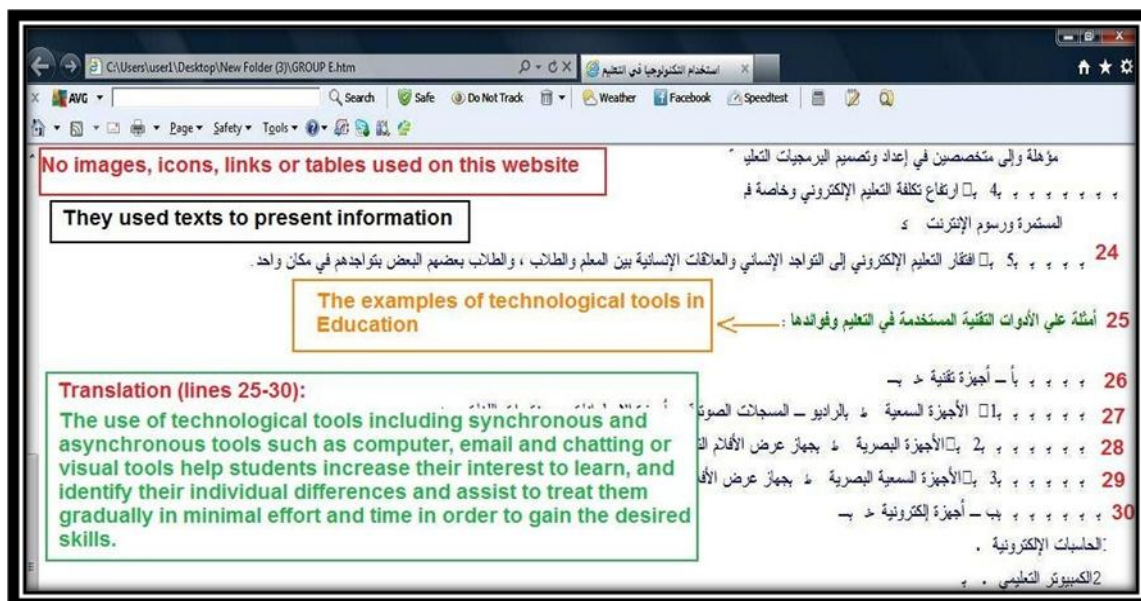


Figure 6.4- Examples of technological tools in Education on group E's website.

This shows that the group members' online discussions were directly reflected in their task. Therefore, the Teaching Assistant gave a good evaluation mark. However, the actual collaboration did not clearly occur and the students did not seem to meet the task expectations. It appeared that the students pursued to meet the task requirements and follow the teacher's instructions instead of collaborating.

Regarding task expectations, the group members did not appear to pay attention to the basics of design in their website, such as different colours of text and background colours, use of images, links, tables, and necessary icons. They only created a webpage including all of the topics. It was clear that these students were interested in framing ideas in a lot of text without linking it to illustrative images. This may be due to cultural considerations of Arabic website design, such as simple user-interface components, detailed information, and a relative simplicity in design and the use of colours. Although the online discussions were strongly related to their website, the content of the group's online discussions were not clearly developed. Additionally, I anticipated that the group members would use different webpages linked together by

essential links and icons on the website. However, the website design was very simple and in a single webpage.

Group E/Task 2

Students' interactions (discussion forum)

The second task required students to create either a podcast about using synchronous/asynchronous tools in Education or a video narrative about using mobile phones in Education. The group members participated in the discussion forum to complete Task 2. Their online discussions were coded at the sentence levels into categories (task process, suggestion and confirmation; the full transcripts for both tasks, see Appendix 6). These categories indicated the decision-making process that the group took to complete the task from week 8 to week 11. Table 6.2 shows the frequencies of these categories derived from the group's interactions in the discussion forum.

Table 6.2 Frequencies of the categories analysed based on the group members interactions.

Frequency 'N'	Codes	Student	Week
0 1 1 0	Task definition Task process Suggestion Confirmation "agreement"	Adham	10
0 0 1 2	Task definition Task process Suggestion Confirmation "agreement"	Asem	10
0 3 1 2	Task definition Task process Suggestion Confirmation "agreement"	Talal	10

Notes.

1. Task definition: Relates to the way of how the group members understand the task and identify the topic.
2. Task process: Relates to how the group members keep the group on track.
3. Suggestion: Relates to how the group members suggest alternatives and solutions to develop the task.
4. Confirmation "agreement": Relates to the statements include "Yes" or "agree", or consist of any agreement in any other way.

Table 6.2 shows that the actual discussions between the group members were recorded in week 10 (OC3.12). This group seemed to have unequal participation levels (task process $n=4$, confirmation "agreement" $n=4$, suggestion $n=3$) as two members (Adham & Talal) oriented the group to the task process by providing information and elaborating on the topics. However, all three members developed the task by suggesting alternatives and used agreement statements to confirm the task process and suggestions. Although the group's work was strongly related to the final task, there was lack of students' interaction to support their work in the discussion forum where they collaborated in one week only over four weeks (OC3.12). Additionally, it appeared that there were incomplete dialogues between the members in the discussion forum (DT3.12).

Based on the students' online contributions (see Appendix 6), discussion about task process was used by the group members four times in one week (OC3.12). Two members (Adham & Talal) attempted to steer the group by providing information about topics and elaborating on discussion forums as a learning tool. They focused on the use of discussion forums as a learning tool for communication and the reasons for using discussion forums in Education (CT2A3.12) (Posts 1, 3, 9 & 11). The three group members suggested alternatives to be included in the task such as the advantages and disadvantages of using discussion forums in Education, and the importance of using discussion forums in Education (CT2A3.12) (Posts 4, 6 & 7). These suggestions were used by the group members three times in one week (OC3.12). Two members (Asem & Talal) used confirmation or agreement statements

four times in one week (CT2A3.12) (Posts 2, 5, 8 &10) to agree with task process and suggestions, and the selection of discussion forums as a topic for their task.

In the discussion forum, Adham initiated the task process by drawing his peers' attention to the topic of their discussion and providing information about discussion forums and their use in Education for communication. He stated:

I think it is a good option for us if we worked on asynchronous tool such as discussion forum. It can be utilised as an effective tool in the learning context. This tool can be implemented for numerous functions such as communication and education. The teacher may use it for educational communication and information transfer. In addition, this tool has an important feature where the teacher's and students' threads can be saved for long time (CT2A3.12), (Post 1).

Talal responded to this initiation with an agreement as he stated "I agree with Adham to select discussion forum as a topic of our discussion for the final task" (CT2A3.12), (Post 2). "Discussion forum can be used in Education as learning tool for educational purposes such as communication with students about the subject" (CT2A3.12), (Post 3). He also attempted to steer the group by focusing on the reasons for using discussion forums in Education. He stated:

The rationale for the use of discussion forum is an important topic to be included in our final product. We need to think carefully about this question: Why do we use discussion forum in Education?.. (CT2A3.12), (Post 9)... We need to answer this question to demonstrate the rationale for using this tool. It is important to focus our response on the learning process. By this way, we also can clarify the importance and the advantages of using this tool (CT2A3.12), (Post 11).

After this, Asem agreed with his peers as he stated "I agree with you guys to focus on the use of discussion forum in Education" (CT2A3.12), (Post 5) and he attempted to develop the task by suggesting alternatives. He stated:

Every learning tool should have advantages and disadvantages in the learning context. These two aspects can support or hinder the teacher or students performances or both of them in the learning process. I suggest to include this

topic because it associates with our discussion. Following this, we can exhibit the significance of discussion forum as learning tool (CT2A3.12), (Post 6).

Talal replied to Asem's post and suggested an alternative by stating "I suggest to focus our discussion on particularly Education field as discussion forum is used for general communication" (CT2A3.12), (Post 4). Moreover, Adham as the group leader developed the task by suggesting the importance of using discussion forums in Education. He stated:

I suggest to explain the importance of using discussion forum, particularly in Education field as Talal suggested. I mean this tool can be used for general communication in public. However, it also is important to be used for educational communication (CT2A3.12), (Post 7).

The following sections demonstrate the students' interactions with each other and with the teacher through the online tools (discussion forum, email tool, chat tool and journal tool).

Students' interactions with the teacher (discussion forum)

The group members were encouraged to respond to the teacher's question posted in the discussion forum. The question was "What is educational communication?". This question was offered to help the group members think about the topic of the task during their interaction within their group. Analysis showed that none of these group members interacted with the teacher's question for Task 2 (DT19.11, DT26.11, DT3.12, DT10.12).

Students' interactions with others and with the teacher (Email tool)

As described, this tool was designed as an optional asynchronous tool to be utilised for discussion on the collaborative tasks and to contact with the teacher for any assistance. It was anticipated that the students would utilise this tool for their

collaborative learning. For example, they could use it to organise a group meeting or appointment to discuss their task. In addition, they could use it to pass on important information or resources for their task. None of the group members used this tool for interaction to complete Task 2 (ET19.11, ET26.11, ET3.12, ET10.12). Instead of emailing, the group members could have used other forms of communication such as mobile phones, social network websites, and face-to-face meetings.

Students' interactions with others and with the teacher (Chat tool)

As described, this tool was intended for synchronous interactions between the group members and with the teacher. The chat tool transcripts indicated that one student (Talal) participated in the week 8 chat session (CT19.11) and one student (Asem) participated in the week 11 chat session (CT10.12). These members discussed the difficulties of Task 1 and the requirements of Task 2 with the teacher. They also asked other group members for suggestions on Task 2 (transcript, see Appendix 8). For example, Talal identified:

I find it difficult to present information in the discussion forum and discuss it with peers.. I mean the process of the task is quite difficult. I think it's hard for me because it's the first time to be engaged in this kind of learning environment. I also find it difficult to use online tools for learning (CT19.11), (Lines 7-12).

He also stated "Our group decided to choose discussion forum as a topic for discussion. Does anyone have other suggestion?" (CT19.11), (Lines 16-18). Asem also stated "We suggested some alternatives to support our topic such as the importance of using discussion forum in Education, and its advantages and disadvantages. Can anyone give us feedback on these?" (CT10.12), (Lines 7-10). The students were required to participate in five chat sessions at minimum over fifteen weeks of the semester. The group members did not meet this requirement as two students (Asem & Talal) participated in one chat session only (CT19.11, CT10.12).

Students' interactions (Journal tool)

As described, this tool was designed to allow the students to reflect on the content of the subject and their own learning. In this task, the journal tool transcripts indicated that there was no participation from any group members during the completion of Task 2 (JT19.11, JT26.11, JT3.12, JT10.12).

Group E's final product

The group members were required to submit 500 words in week 11 and then submit an audio or video file in week 13 based on their online discussions. Each group member was required to post five responses at minimum to discuss the task and each response had to contain at least 100 words. The assessment criteria for this task required the students to create a podcast or video narrative using an appropriate design, with clarity of general presentation and development of the ideas discussed in the discussion forum (see Appendix 5).

In order to help the students design their product, a lecture of different types of technological tools that can be used in Education such as visual, audio, and audio-visual tools was given to the students for an hour in week 4 of the second iteration (see Appendix 5). After the lecture, the group members were to create a design that comprises of a proper presentation of the product and a developed discussion of the content including sufficient detail yet in a reasonable time (2-5 minutes). The group members submitted their plan of 500 words in the Bb system. The plan included topics from the discussion forum (the use of discussion forums as a learning tool, the rationale for using discussion forums in Education, the advantages and disadvantages of using discussion forums in Education, and the significance of using discussion forums in Education) (CT2B24.12). Analysis showed that the members planned to define discussion forums as the main topic, supported by other topics such as the advantages and disadvantages of using discussion forums in Education, the

importance of using discussion forums in Education, and the reasons for using discussion forums in Education.

The group members created an audio file using RealPlayer for approximately 2 minutes. This audio recording included all of the topics planned and discussed in the discussion forum, and this file was transcribed for analysis (see Appendix 7). In the final task (audio file), the students defined the discussion forum as a communication tool that can be implemented for learning in different educational settings. They stated:

Discussion forum is a learning tool that can be used for asynchronous communication between students and with their teacher, especially for educational discussions, regardless of time and place. This tool can be used in diverse learning environments (CT2B24.12).

They discussed the advantages and disadvantages of discussion forums in the learning process and connected these two sides (positives and negatives) to the importance of this tool for educational communication. They focused on its advantages as they stated:

The important advantage of discussion forum as learning tool is that this tool can be used for open asynchronous communication with disregard of time and place. This means that teachers or students can post their threads or responses at anytime from anywhere. However, poor typing skills could be one of the disadvantages (CT2B24.12).

In addition, they focused on the field of Education by elaborating on the significance of using discussion forums in Education as well as the rationale for using this tool for educational communication. They stated:

Discussion forum can be used for general communication which is important to reinforce commercial and social affairs. On the other hand, it also is significant to be used for educational communication to enhance the rapport between teachers and students (CT2B24.12).

They attempted to support their discussions by posting this question: "Why do we use discussion forum in Education?" (CT2B24.12). After this, they stated:

Using discussion forum in Education can facilitate the learning process. For example, the teacher can post key questions of the subject in the discussion forum for students at anytime. Students also can respond to these questions at anytime (CT2B24.12).

In this task, the members described discussion forums as communication tool for learning, discussed positives and negatives, linked them to the significance of this tool for educational communication, and presented the reasons for the use of discussion forums in Education. All of these topics were discussed in the discussion forum. Hence, the Research Assistant gave this task a good mark. However, the actual collaboration did not obviously occur because the group members, who did not play the collaborative roles to finish the task. In this instance, Adham did not play the actual role of group leader, as he did not take the responsibility to guide the interaction within the group or distribute other collaborative roles between the members in order to complete the task. Analysis of the students' contributions indicated that the students did not appear to meet the task expectations. It seemed that they participated to meet the task requirements and followed the teacher's instructions rather than collaboratively learning.

In this final task, the students transferred the online discussion from a written form to an audio file. It appeared that they completely copied the information from the discussion forum and pasted it into their task without any clear development of the ideas. This may be due to cultural considerations such as unfamiliarity with collaborative online learning environments. I expected to receive the group's task with developed content from the topics discussed in the discussion forum. However, it was very simple.

Summary

Collaborative roles have been demonstrated to examine the social/cultural issues that can be derived from the students' collaboration in the discussion forum. In this group, the students grouped themselves and assigned a leader (Adham) as they were asked. This leader was supposed to provide feedback and direction, set achievable goals, identify problems, increase communication, and encourage participation. However, the leader's role and other collaborative roles were not clearly allocated amongst the group members in their discussions as they shared the roles and supported each other to complete the two collaborative tasks (DT29.10, DT5.11, DT3.12).

In Task 1, it appeared that there was a shared role between two members (Adham & Asem) to urge the members and provide information in order to steer the group and keep the members on track. They both drove their peers' attention to the definition of the use of technology in Education at the commencement of their discussions and focused on the examples of technological tools in Education in order to orient the group in a direction (CT1A29.10). In addition, these two students shared to develop the task by suggesting alternatives such as the reasons for the use of technology in Education, and the advantages and disadvantages of using technology in Education. For example, Adham attempted to take on the leadership role by stating "We should know what the rationale for using technology in Education is. I suggest to include this topic because this will assist us to identify the use of technology in Education" (CT1A29.10), (Posts 4 & 5). Talal seemed to be the least active member as he attempted to develop the task by sole suggestion. He stated "I suggest to include one example of using technological tool in Education such as a visual tool instead of different examples" (CT1A5.11), (Post 14).

In Task 2, the collaborative roles such as the leader's role were not clearly defined as it was in the first task (DT3.12). The three group members shared roles and supported each other to finalise the task. The students oriented the group to the task by focusing on the use of discussion forums in Education and elaborating on the

reasons for using discussion forums in Education (CT2A3.12). They also developed the task by suggesting alternatives such as the advantages and disadvantages of using discussion forums in Education, and the importance of using discussion forums in Education (CT2A3.12).

Despite this, the group's work was directly reflected in their tasks. There was lack of students' collaboration in the discussion forum to support the group work as the members did not meet the requirement of five participations for each member and they only interacted in two weeks from week 3 to week 7 to complete the first task (OC29.10, OC5.11) and interacted in one week only from week 8 to week 11 to complete the second task (OC3.12). It also seemed that there were incomplete conversations between the students in the online discussions for both tasks (DT29.10, DT5.11, DT3.12). This shows key factors of social or cultural issues that the students reported in the interviews. The three group members reported that they had experienced face-to-face instruction in high school and at the university and none of them have used Internet for learning or educational purposes (SPI4.10). Furthermore, Asem identified that his group has difficulties in organising thoughts and delivering ideas via the online discussions as well as problems in understanding the ideas posted in the discussion forum (SII29.11, SPOI3.1). Adham also identified that "I feel it is difficult sometimes to share all information that I have with my colleagues in the discussion forum" (SPOI3.1).

Second iteration focus: Student interpretations of the tasks

In the first iteration, students reported difficulties in achieving the requirement of the tasks. Three students from three groups (A, C & D) identified that the requirement of a 500 words task proposal was a limitation, and the duration of Task 1 (five weeks) was not sufficient to complete the task (JT2.4, JT9.4, SII10.4). In the second iteration, it was expected that group E's members would respond properly to the teacher's solutions, and understand the teacher's instructions for the subject, the content of the subject, the task requirements, and the topics of their tasks

(CT1B19.11, CT2B24.12). To show this, a discussion of the group data is described and particular emphasis is given to student understanding and knowledge construction.

In response to the issues revealed from the first iteration, possible solutions were developed to clearly demonstrate the task requirements for the students to ensure student knowledge construction. In the second iteration, the teacher posted key questions weekly in the discussion forum to help the students think deeply and in a scaffolded way about the discussion and to explore the elements of the task. For example, I posed these questions: "What is technology in Education?", "How can technology be used in the classroom?", "Why does the teacher use technological tool in the learning process?" and "When does the teacher apply technological tools in the classroom?". In order to enhance student learning, I provided the students with feedback and comments along the way regarding their responses in the discussion forum to help shape their understandings. In addition, I sent a weekly message to the students' emails on the Bb system to remind them about using the online tools for their discussions.

Group E/Task 1

Students' knowledge construction (discussion forum)

This section demonstrates how the group members understood the task requirements and their topics, and constructed knowledge within their accomplishment of the tasks. As previously stated, this task required students to create a website about the use of technology in Education. In the discussion of collaboration, it was identified that the task was defined only once by one member (Asem) in week 5 (OC29.10), discussion about task process was used by two members (Asem & Adham) five times in one week (OC29.10), suggestions were raised by all three group members five times in two weeks (OC29.10, OC5.11) and agreement statements were used by the members three times in two weeks (OC29.10, OC5.11) (see Table 6.1).

To explicate the students' understandings of the task (see Appendix 6), the main topic of the task was only defined once by one member (Asem) (task definition $n=1$). He stated:

We need to define the term of technology in Education and how this can be used. I think this will be a good way for us to start with the definition which leads us to the related topics (CT1A29.10), (Post 1).

This student attempted to define the topic of the task to his peers and lead them into discussion. However, no question was asked to describe student knowledge about the topic or to encourage other members to think about the topic. It was simply an informational post including an invitation to build new knowledge.

Discussion about task process was used by two members (Asem & Adham) (task process $n=5$). They tended to keep the conversation on track by providing additional information about the term of technology in Education, the reasons for using technology in Education, and examples of technological tools in Education (CT1A29.10). For example, Asem stated:

The use of technology in Education enhances the all elements of the learning process including teachers, students, teaching methods, the subject, the learning materials and the learning environment (CT1A29.10), (Post 10).

Another example, Adham stated:

The inclusion of different examples of technological tools such as visual or audio tools in our work is useful to clarify in which way the technology can be applied to improve students' skills in the learning environment (CT1A29.10), (Post 11).

This suggests that the students understood the topic posted in the discussion forum as they kept participating in the discussion forum in response to the topic and they did not terminate the online discussion by posting irrelevant messages which would redirect attention of other members away from the main topic. However, Talal did

not participate with his peers to steer the group and he seemed to be unengaged in this particular process.

All three group members (Adham, Asem & Talal) developed the task by suggesting different alternatives (suggestion $n=5$) including the rationale for using technology in Education, the advantages and disadvantages of using technology in Education for both teachers and students, and different examples of using technological tools in Education (CT1A29.10, CT1A5.11). For instance, Adham stated:

We should also know what the rationale for using technology in Education is. I suggest to include this topic because this will assist us to identify the use of technology in Education and then link it to other topics (CT1A29.10), (Post 5).

In another instance, Talal stated "I suggest to include one example of using technological tool in Education such as visual tool" (CT1A5.11), (Post 14). These students appeared to suggest alternatives for input and encouraged their peers to participate by providing perceptive feedback. It seemed to be a call for other group members to share their knowledge and understanding about the topic or to provide comments on the topic. Based on the students' discussions, there was no feedback or comments from other group members after the suggestion statements, and they appeared to be incomplete conversations.

The group members used agreement statements three times in two weeks (OC29.10, OC5.11) (confirmation "agreement" $n=3$). Agreement statements with other group members means the students agreed with other peers about the process of the task made by the group including task definition, discussion about the task, and suggestions on the topic. For example, Asem stated "I agree with Adham to stress on the rationale for using technology in Education" (Post 6). After this, he posted "I think it is important to include the advantages and disadvantages of using technology in Education" (CT1A29.10), (Post 7). Another instance, Talal stated "I agree with you guys to include the rationale for using technology in Education, the advantages and disadvantages of using technology in Education for both teachers and students"

(Post 13). After this, he posted "I suggest to include one example of using technological tool in Education" (CT1A5.11), (Post 14).

These students agreed with their peers about a particular topic and did not continue to post messages to elaborate on their understandings of the topic. They diverted the discussion to other topics. Asem did not illustrate his understanding when he agreed with Adham to focus on the reasons for using technology in Education by expanding on this topic. He changed the discussion to the topic of the advantages and disadvantages of using technology in Education. In addition, Talal agreed with his peers to include the rationale for using technology in Education, and the advantages and disadvantages of using technology in Education for both teachers and students. However, he switched the discussion to the examples of technological tools in Education without any further feedback or comments on the topics.

Based on the above, it seemed that the students had difficulties to make meaning and show understanding within their completion of the task. It is important that these students include challenging questions to enhance thinking which gives an opportunity to make meaning of their topics. However, their contributions were simply informational posts. In addition, the group members did not ask questions about the initiating information nor did they provide feedback on the information. They also did not respond with further comments when they agreed with statements made by other group members during the discussion, nor did they post any messages about their own personal experiences with the topic. These issues could refer to cultural considerations such as difficulties in organising thoughts, delivering information via the online discussions, and problems in understanding the ideas posted in the discussion forum (SII29.11, SPOI3.1). The following sections describe the students' understanding of the teacher instruction, the subject content, and the task requirements through their interactions in the online tools (discussion forum, email tool, chat tool and journal tool).

Students' understandings within their interaction with the teacher

As described in the previous focus section, the teacher posed four different questions in the discussion forum after the lecture from week 3 to week 6 to help the students think deeply about the topic of the task. The questions were:

- What do you know about technology in Education?
- What are the technological tools used in Education?
- Why do we use technological tools?
- What are the norms of using technological tools?

It was expected that these questions would assist the students to construct knowledge and understand the topic of the task. They were also instructed to let the teacher know if they understand the topics and are not confused. Analysis showed that none of the group members responded to these questions from week 3 to week 7, and there were no questions asked by the students regarding the teacher's instructions.

Students' knowledge construction (Email tool)

As described, this tool was designed as an optional asynchronous tool to be used by the group members for their discussion. None of the group members used the email tool for the task (ET15.10, ET22.10, ET29.10, ET5.11, ET12.11).

Students' knowledge construction (Chat tool)

As described, this tool was designed as a synchronous tool to allow the students to discuss the requirements of the tasks or difficulties with completion of the tasks. The group members were also encouraged to use it for group meetings. Analysis showed that Adham and Asem participated in three chat sessions each (CT22.10, CT5.11, CT12.11, CT29.10, CT5.11, CT12.11) (transcript, see Appendix 8). In terms of students' knowledge construction, these students asked peers from other groups for

suggestions and feedback on their topics to improve their work during the conversation. For example, Asem presented the topics that his group decided to discuss in their final task, and then he asked this question "What do you think guys about this?" (CT29.10), (Lines 9-17). Adham also commented "if you have other suggestions guys to improve our work, this will be appreciated" (CT5.11), (Lines 15-17).

Students' knowledge construction (Journal tool)

As described, this tool was designed to allow student reflection on the content of the subject and their own learning. In this task, two members (Adham & Talal) used this tool to reflect on their own learning (transcript, see Appendix 9). In terms of knowledge construction, Talal appeared to refer to his understanding of the subject content and the task requirements to his engagement in group work as he identified "The completion of task becomes much easier within group work" (JT22.10) and "Teamwork allows to understand the content of the subject and simplifies the requirements of the task" (JT29.10). On the other hand, Adham seemed to have difficulties with knowledge construction during the discussion as he identified "it is difficult sometimes to share all information that I have with my colleagues in the discussion forum" (JT5.11).

Group E's final product

In terms of knowledge construction, this task was assessed based on the students' ability to make meaning and understanding in order to provide evidence of development of the ideas discussed during the online discussions. This means that the students would interact with information and ideas, examine implications of ideas, pose challenging questions or hypotheses about ideas, and develop and build on ideas through reactions and responses. In this final task (website), it was expected that the group members would:

- Identify the main concepts and facts related to technology and its implementation in Education.
- Discuss frequent examples and types of technological tools that can be used in the classroom.
- Connect the use of technology to the field of Education.
- Design and produce a website that contains topics with developed discussion of information on the use of technology and its implications in the learning process.

This group created a website about the use of technology in Education. On this website, it seemed that the group members grasped the main concept of the task which was the use of technology in Education. The topics were a definition of the use of technology in Education, the reasons for using technology in Education, the advantages and disadvantages of the use of technology in Education, and examples of technological tools that can be used in Education (CT1B19.11).

The group members attempted to identify the use of technology in Education and described their understanding of knowledge into these topics. For example, they defined the term of technology in Education as "different tools that can be used to support teaching and learning process in several educational settings". They also defined it as "a method of teaching that is used by the teacher to motivate the learners to their learning as well as the subject in the learning process" (CT1B19.11, Figure 6.2).

The students showed their understanding of technology in Education by listing some reasons for using technology in Education. For instance, they argued that "technology in Education can enhance teaching approach which helps students positively interact with the learning materials. It also helps improve teachers and student skills" (CT1B19.11, Figure 6.2). In addition, they attempted to describe their understanding of the term of technology in Education by providing information on the advantages and disadvantages of the use of technology in Education. For

example, they discussed that this technology "encourages students to learn and develops their cognitive skills. It also improves teacher's performances in the learning environment", and they described the disadvantages as "it can cause isolation because of lack of direct communication between students and with their teacher" (CT1B19.11, Figure 6.3). They also emphasised their understanding of technology in Education by presenting some examples of technological tools that can be used in the classroom. For example, the group members argued that "computer, email and chatting or visual tools help students increase their interest to learn" (CT1B19.11, Figure 6.4).

In order to meet the task requirements, the groups' discussion on their website showed that there was no actual evidence of development of the ideas discussed in the discussion forum in order to illustrate the students' understanding of the task. The group members appeared to formulate the ideas into similar words from the discussion forum. For example, Asem defined the term of technology in Education in the discussion forum as "the tools that are used in the classroom by the teacher" (Post 3) or it could be defined as "the teaching methods that are implemented" (Post 3) or "the way of communication between the teacher and students" (CT1A29.10), (Post 3). On their website, the group members argued that technology can be defined as "different tools that can be used to support teaching and learning process" or "a method of teaching that is used by the teacher to motivate the learners" (CT1B19.11). Another example, Adham provided some examples of technological tools in the discussion forum as he stated "The inclusion of different examples of technological tools such as visual or audio tools in our work is useful" (CT1A29.10), (Post 11). On their website, they presented synchronous and asynchronous tools as examples of technological tools. They stated "The use of technological tools including synchronous and asynchronous tools such as computer, email and chatting or visual tools help students increase their interest to learn" (CT1B19.11).

This also indicated that there was a lack of interaction by the members to share their understandings of the ideas, expand on ideas of the topics discussed, or build on the

topics to improve the task. In this instance, the group members did not add any new objects to their website such as relevant images or necessary links. Additionally, they did not summarise their discussion or argument of the topics to help the reader know how they solved a problem or how the knowledge obtained was used.

Group E/Task 2

Students' knowledge construction (discussion forum)

As previously stated, this task required students to create either a podcast about using synchronous/asynchronous tools in Education or a video narrative about the use of mobile phones in Education. Discussion about task process was used by two members (Adham & Talal) four times in one week (OC3.12), suggestions were raised by all three group members three times in one week (OC3.12) and agreement statements were used by two members (Asem & Talal) four times in one week (OC3.12) (see Table 6.2).

To demonstrate the students' understandings of the task (see Appendix 7), two members (Adham & Talal) attempted to keep the group on track by providing additional information about the use of discussion forums as learning tool (task process $n=4$). They elaborated on the use of discussion forums as learning tool for communication and the reasons for the use of discussion forums in Education (CT2A3.12). For example, Adham stated:

This tool can be implemented for numerous functions such as communication and education. The teacher may use it for educational communication and information transfer. In addition, this tool has an important feature where the teacher's and students' threads can be saved for long time (CT2A3.12), (Post 1).

Another example, Talal stated:

The rationale for the use of discussion forum is an important topic to be included in our final product. .. It is important to focus our response on the

learning process. By this way, we also can clarify the importance and the advantages of using this tool (CT2A3.12), (Posts 9 & 11).

This suggests that the students understood the topic of the discussion forum as they continued to post additional information in the discussion forum related to the topic. They attempted not adding any irrelevant information which would cease the online discussion. However, Asem did not participate with his group members and his understanding of the topic did not clearly emerge in this particular process.

All group members developed the task by suggesting alternatives (suggestion $n=3$) such as the advantages and disadvantages of using discussion forums in Education and the significance of using discussion forums in Education (CT2A3.12). For instance, Asem stated:

Every learning tool should have advantages and disadvantages in the learning context. These two aspects can support or hinder the teacher or students performances or both of them in the learning process. I suggest to include this topic because it associates with our discussion. (CT2A3.12), (Post 6).

Another instance, Adham stated "I suggest to explain the importance of using discussion forum, particularly in Education field" (CT2A3.12), (Post 7). In terms of knowledge construction, these students seemed to participate in suggestion statements asking for input from other group members and urging them to provide useful feedback. It seemed that they wanted their peers to share knowledge and understanding about the topic by providing insightful comments. From the students' contributions, there were no suggestion statements followed by feedback or comments from other members and they seemed to be incomplete discussions.

Two members (Asem & Talal) used agreement statements four times in one week (OC3.12). They used these statements to emphasise that they agreed about the process of the task such as the selection of discussion forums as a topic, discussion about the task, and suggestions on the topic. For example, Talal stated "I agree with Adham to select discussion forum as a topic of our discussion for the final task" (Post

2), and then he stated "The rationale for the use of discussion forum is an important topic" (CT2A3.12), (Posts 9 &11). Another example, Asem stated "I agree with you guys to focus on the use of discussion forum in Education" (Post 5), and then he commented "Every learning tool should have advantages and disadvantages in the learning context" (CT2A3.12), (Post 6).

These students did not clearly elaborate on their understanding about a specific topic as they did not provide continuous feedback or comments on the topic. They tended to switch the discussion to other topics after their agreement statements. Talal did not show his understanding when he agreed with Adham to focus on discussion forums as a topic by elaborating on this tool as learning tool. He altered the discussion to the topic of the rationale for the use of discussion forums. Moreover, Asem agreed with his peers to stress on the use of discussion forums in Education. However, he diverted the discussion to the advantages and disadvantages of this tool in the learning context without any further feedback or comments on the topic agreed.

From the above, it appeared that the group members found it difficult to show their understanding of the topics in the online discussion. For example, it is significant that these students include challenging questions to promote thinking which provides an opportunity to make meaning of the topics. However, their contributions were simply informational posts. The group members did not ask questions about the information posted by other members or provide feedback or comments on the information. They also did not respond with further information or comments when they agreed with statements made by other members. These issues could be related to cultural considerations such as problems of thought organisation and information delivery via the online discussions as well as problems of understanding the ideas posted in the discussion forum as the students reported in the interviews (SII29.11, SPOI3.1). The following sections present the students' understandings of the teacher instruction, the subject content, and the task requirements within their interactions in the online tools (discussion forum, email tool, chat tool and journal tool).

Students' understandings within their interaction with the teacher

As described in the previous focus section, the teacher posted a question "What is educational communication?" in the discussion forum to help the students think deeply about the topic of the task. It was expected that this question would assist the students to construct knowledge and understand the topic of the task. It also helps the teacher know if the students understand the instructions and are not confused. None of the group members responded to the question from week 8 to week 11. There were also no questions asked by the students regarding the teacher instructions.

Students' knowledge construction (Email tool)

As described, this tool was designed as an optional asynchronous tool to be used by the students for their discussion. None of the group members participated in this tool for the task (ET19.11, ET26.11, ET3.12, ET10.12).

Students' knowledge construction (Chat tool)

As described, this tool was designed as a synchronous tool to allow the students to discuss the requirements of the tasks or difficulties with completion of the tasks. The group members were also encouraged to use it for group meetings. Analysis indicated that two members (Adham & Talal) participated in a chat session (CT19.11, CT10.12) (transcript, see Appendix 8). In terms of students' knowledge construction, these students asked their peers from other groups for suggestions and feedback on their work. For instance, Talal found some difficulties in the learning environment as he identified "I find it difficult to present information in the discussion forum and discuss it with peers" (CT19.11) (Lines 7-12) and then, he stated "Our group decided to choose discussion forum as a topic for discussion. Does anyone have other suggestion?" (CT19.11), (Lines 16-18). In addition, Asem stated "We suggested some alternatives to support our topic such as the importance of using

discussion forum in Education, and its advantages and disadvantages. Can anyone give us feedback on these?" (CT10.12), (Lines 7-10).

Students' knowledge construction (Journal tool)

As described, this tool was intended to allow the student reflection on the content of the subject and their own learning. None of the group members used this tool for the task.

Group E's final product

In terms of knowledge construction, this task was assessed based on students' understandings and ability to interact with information and ideas, examine implications of ideas, pose challenging questions or hypotheses about ideas, and build on the ideas through reactions and responses. In the final task (audio file) (transcript, see Appendix 7), it was expected that the group members would:

- Identify the main concepts and facts related to the use of discussion forums as learning tool.
- Discuss different examples of the implementation of discussion forums in Education.
- Demonstrate its usefulness for educational communication and produce an audio file that comprises relevant topics with developed discussion of information on the use of discussion forums and its implications in the learning process.

This group produced an audio recording about the use of discussion forums as a learning tool. It appeared that the students understood the main concept of the task, which was about using synchronous or asynchronous tools in Education. Their topics were a definition of discussion forums as a communication tool, the advantages and

disadvantages of discussion forums in the learning process, and the rationale for using discussion forums and its importance in Education (see Appendix 7). In terms of knowledge construction, these students attempted to identify the use of discussion forums as learning tool for communication. In this instance, they defined it as "a learning tool that can be used for asynchronous communication between students and with the teacher, especially for educational discussions, regardless of time and place" (CT2B24.12), (Lines 9-14).

They confirmed their understanding of the use of discussion forums in Education by presenting some advantages and disadvantages of discussion forums in the learning process. In this instance, they focused on the advantages as they argued that "this tool can be used for open asynchronous communication with disregard of time and place" (CT2B24.12), (Lines 16-17). They also described their understanding of the topic by arguing that the use of discussion forums in Education is important for communication. For example, they stated "it also is significant to be used for educational communication to enhance the rapport between teachers and students" (CT2B24.12), (Lines 25-26). They also emphasised their understanding by providing some reasons for using discussion forums in Education. For instance, they emphasised that "Using discussion forum can facilitate the learning process... the teacher can post key questions of the subject in the discussion forum for students at anytime" (CT2B24.12), (Lines 30-32).

It appeared that there was no actual evidence of development of the ideas discussed in the discussion forum to demonstrate the students' understanding of the task. The group members seemed to transfer the information in the discussion forum to an audio recording for their final task without any actual development of ideas. For example, Adham provided information about discussion forums and defined it as the tool that "can be implemented for numerous functions such as communication and education" (CT2A3.12), (Post 1). In their final task, the group members defined discussion forums as "a learning tool that can be used for asynchronous communication between students and with their teacher, especially for educational

discussions" (CT2B24.12), (Lines 9-14). In another example, Adham suggested to include the importance of discussion forums in Education as he stated "this tool can be used for general communication in public. However, it also is important to be used for educational communication" (CT2A3.12), (Post 7). In their final task, the group members stated "Discussion forum can be used for general communication which is important to reinforce commercial and social affairs" (Lines 23-24), and then they stated "it also is significant to be used for educational communication to enhance the rapport between teachers and students" (CT2B24.12), (Lines 25-26). These examples showed that there was a lack of interaction by the group's members to share their understandings of the topics, and expand and build on the ideas of the topics discussed to improve their task.

Summary

The group members had difficulties with their understandings of the topics during their discussions. In the discussion forum, they did not clearly interact with the information and ideas, or provide feedback or comments. They did agree with statements made by other members, but they did not share information with other group members about their personal experiences with the topic. In their tasks, it seemed that there was a lack of evidence relating to the development of ideas discussed, as the group members did not expand on the ideas and concepts of the topics, or add any useful objects such as images or necessary links to their website. These aspects indicate key factors of social or cultural issues that the students reported in the interviews, such as the students' experiences of face-to-face instruction in high school and at the university, inexperience in using the Internet for learning or educational purposes (SPI4.10), difficulties in organising thoughts and delivering ideas through online discussions, and problems in understanding the ideas posted in the discussion forum (SII29.11, SPOI3.1).

Second iteration focus: Issues of communication

The first iteration revealed a number of issues related to communication via the online tools between the group members and with the teacher which has impacted on student collaboration. These issues were consistent with technical problems and lack of harmony among the group members. In this example, 12 students reported that technical difficulties, including lack of Internet and computer access in the computer lab, were the most significant factors restricting their communication to complete the two collaborative tasks (JT26.3, JT2.4, JT9.4, JT16.4, JT23.4, JT30.4, JT7.5, SPII10.4, SPOI29.5). In addition, three students from three groups (B, D & E) reported that they experienced difficulties in communication with their group members due to a lack of harmony (JT26.3).

In an effort to minimise problems of communication in the second iteration, I addressed the issues by providing technical support and enabling group cohesion. First, I contacted the Education Technologies Department in the Faculty of Education and eLearning Deanship at KFU and informed them of technical difficulties. Second, in order to resolve a lack of harmony amongst group members, the students were encouraged to establish their own groups of three in the orientation weeks. It was hoped that this would enable group cohesion and facilitate communication between the group members. It was expected that the extra teacher support and the other issues being addressed would enhance communication amongst group members, encourage participation, and enhance familiarity with the online tools.

In the second iteration, It was expected that group E's members would appropriately respond and therefore not confront barriers which could hinder their communication to accomplish the tasks (CT1B19.11, CT2B24.12). To show this, a discussion of data analysed is described and particular emphasis is given to teacher expectations of the tasks including assigned task requirements to enhance student communication, the group members' communication within their completion of the tasks, and

cultural/contextual factors that could affect their communication that were reported by the members.

Teacher expectations of the tasks

This section presents explanations of how to use the online tools for communication and collaboration, of assigned task requirements, and of the adjusted teacher's support to enhance communication and encourage participation in a scaffolded way. In the orientation weeks of the semester (the first two weeks), I introduced the tasks to the students and explicated to them how to use the online tools provided on the Bb system. Those students were provided with an opportunity to have their questions or inquiries about the collaborative tasks and the use of online tools answered by the teacher face-to-face in the computer lab or via email on the Bb system. In addition, the students were encouraged to introduce themselves to their group members in the discussion forum on the Bb system during the orientation weeks. It was expected that this task would increase the sense of familiarity with the online learning environment before the commencement of the study.

In order to enhance student communication in the second iteration, the subject details and assigned task requirements were explained to the students by the teacher face-to-face in the orientation weeks as follows:

- Each student had a copy of the subject outline clarifying these requirements (see Appendix 5).
- Each group was informed of the requirements of using the online tools.
- Each student was required to post five responses at minimum and each response must consist of at least 100 words.
- Each student was required to participate in five chat sessions at minimum over the semester which were organised by the teacher for an hour each week.

In order to encourage student participation in the online tools and support their communication:

- I posted (three-four) key questions (e.g. Why?, How?, Why?) weekly in the discussion forum to urge student communication.
- I increased responses and feedback regularly on the students' replies on the tasks in the discussion forum.
- I also reminded the students to participate in the chat tool, and to use journal tool to reflect on their own learning in each class in the computer lab.
- A message was sent weekly to the students' emails on the Bb system to remind them to use this tool for communication and to participate in the other online tools.

Students' communication in completing the tasks

This section describes how the group members (Adham, Asem & Talal) communicated with each other and with the teacher via the online tools on the Bb system in order to finalise the collaborative tasks. As previously stated, the first task required students to create a website about the use of technology in Education. Table 6.3 shows the frequencies of using the online tools by the group members to complete the first task from week 3 to week 7 based on each student's response in each online tool.

Table 6.3 Frequencies of using the online tools for Task 1.

Frequency 'N'	Week	Tool
14	5 & 6	Discussion forum
0	0	Email
10	4, 5, 6 & 7	Chat
6	4, 5 & 6	Journal

As shown in Table 6.3, the group members posted 14 responses in the discussion forum to complete Task 1 in two weeks (DT29.10, DT5.11) from week 3 to week 7

(see Appendix 6). These responses were from the group members to communicate with each other regarding the task, and they were coded at the sentence level into categories (task definition, task process, suggestion and confirmation) for analysis as stated in the previous sections to discuss student collaboration and their interpretations of the tasks.

The group members also posted ten responses within four chat sessions that were organised by the teacher in week 4 (CT22.10), week 5 (CT29.10) , week 6 (CT5.11) & week 7 (CT12.11). In these chat sessions, the group members discussed the requirements of Task 1 with the teacher and discussed their topics with peers (see Appendix 8). In the week 4 chat session, one student (Adham) posted three responses within this session. He communicated with the teacher asking about the task requirements and presenting his understanding of the task as he stated "I have understood that every group member should participate in five responses related to the topic, and then these responses are arranged to be submitted with the assistance of the group leader" (Lines 5-8), and then he asked this question "Can you please explain how to discuss topics between the group members?" (Lines 14-15).

In the week 5 chat session, one student (Asem) posted two responses. He described the task requirements as he said "I think the requirement of the task is generally clear" (Line 5). He also described what his group decided to discuss for the task, and then he asked other group members for suggestions as he said "We decided to focus on the definition of the use of technology in Education on our website and we will discuss other related topics.... What do you think guys about this?" (Lines 10-16). In the week 6 chat session, analysis showed that three group members (Adham, Asem & Talal) posted three responses. They communicated with other group members as they emphasised what they have decided to discuss for their task and asked their peers for suggestions. Adham stated:

our work is divided into sub-topics: Definition of the use of technology in Education, the reasons for using technology in Education, the advantages and disadvantages of using technology in Education, and the examples of

technological tools in Education.... So, if you have other suggestions guys to improve our work, this will be appreciated, especially on the sub-topics (Lines 8-17).

Asem also supported Adham by stating "these areas or topics will be discussed in the discussion forum, which means all of you can see this. So, your feedback and comments are welcome" (Lines 21-24). In the week 7 chat session, two students (Adham & Asem) posted two responses. They communicated with the teacher asking about task assessment as Adham stated "Could you please explain how this task is going to be assessed?" (Lines 8-9). Additionally, Asem stated "Is this task assessed based on group work or individual work?" (Lines 18-19).

They posted six responses in the journal tool to reflect on their own learning (JT22.10, JT29.10, JT5.11) (see Appendix 9). However, analysis showed that none of the group members used the email tool to communicate with each other or with the teacher for Task 1. It would be likely that they used other forms of communication such as mobile phones, social network websites, or face-to-face meetings.

The second task required students to create either a podcast about using synchronous/asynchronous tools in Education or a video narrative about the use of mobile phones in Education. Table 6.4 shows the frequencies of the use the online tools by the group members to complete the second task from week 8 to week 11.

Table 6.4 Frequencies of using the online tools for Task 2.

Frequency 'N'	Week	Tool
11	10	Discussion forum
0	0	Email
3	8 & 11	Chat
0	0	Journal

As shown in Table 6.4, the group members posted 11 responses in the discussion forum in one week (DT3.12) to complete the task from week 8 to week 11 (see

Appendix 6). These responses were from the group members to communicate with each other regarding the task, and they were coded at the sentence level into categories (task process, suggestion and confirmation) for analysis as discussed. Two of the students (Asem & Talal) posted three responses within two chat sessions that were organised by the teacher in week 8 (CT19.11) & week 11 (CT10.12). The group members discussed the difficulties of Task 1 and the requirements of Task 2 with peers and with the teacher (see Appendix 8).

In the week 8 chat session, one student (Talal) posted two responses. He described the difficulties that he has faced during his interaction with his group members. He stated:

I find it difficult to present information in the discussion forum and discuss it with peers.. I mean the process of the task is quite difficult. I think it's hard for me because it's the first time to be engaged in this kind of learning environment. I also find it difficult to use online tools for learning (Lines 7-12).

He also declared the topic of his group for task discussion and asked his peers for suggestions. He stated "Our group decided to choose discussion forum as a topic for discussion. Does anyone have other suggestion?" (Lines 16-18). In the week 11 chat session, one student (Asem) posted one response. He communicated with his group members as he emphasised the topic that his group chose and asked other group members for feedback. He stated "We suggested some alternatives to support our topic.... Can anyone give us feedback on these?" (Lines 7-10). None of the group members used the journal tool or the email tool for communication to complete Task 2 from week 8 to week 11.

Based on the frequencies of using the online tools and the observation data, it seemed that communications between the group members and with the teacher through the online tools were less than the first iteration in order to complete the collaborative tasks. The following sections demonstrate cultural or social factors that could have affected the students' communication.

Cultural/social issues within student communication

Cultural/social issues reported by the group members restricted their communication in order to complete their tasks (SII29.11, SPOI3.1). From the interviews data, Adham reported "I feel that face-to-face communication is the key to success in completing the task" (SII29.11, SPOI3.1). Talal also said "I prefer to be engaged in face-to-face communication. However, online communication is more convenient. You can have Internet access anywhere on your phone" (SII29.11, SPOI3.1). The group members (Adham, Asem & Talal) identified that they established their own group based on friendships (SII29.11). They agreed that they were friends and their face-to-face communication could be transferred to online communication for the subject. However, they all identified that they prefer face-to-face communication instead of online communication in order to complete the tasks (SII29.11, SPOI3.1).

A preference for face-to-face interaction could relate to cultural/social factors such as students' belief in the importance of face-to-face instruction for learning. It is certain that students have had more experience with direct communication in face-to-face learning environments that has let them feel that this method is better than online communication. Within this instance, these students reported that they had engaged in face-to-face instruction in high school and at the university and they have not used Internet for learning or educational purposes (SPI4.10). This could explain Adham's statement "face-to-face communication is the key to success in completing the task" (SII29.11, SPOI3.1). It could also further explicate the absence of collaborative roles amongst the group members to complete the tasks. For example, there was a sharing of roles between two members (Adham & Asem) to provide information about the topics for the first task. It appeared that Adham as the group leader did not take on the leader's responsibility to steer the group. Talal was the least active member.

Interview responses suggest that group members have a preference for face-to-face communication. Asem reported "I feel that I am more likely to complete the task when I am encouraged to be engaged in face-to-face communication with the teacher

and other students, but it is not convenient like online communication" (SII29.11, SPOI3.1). Asem seemed to hold mixed beliefs about whether face-to-face communication is more motivating but he also felt it was not as convenient as interacting online. Another instance, Adham commented that "face-to-face communication with other students is a better option because messages through online communication can simply be misunderstood as one written word can be explained by different meaning, but it can directly be interpreted in the precise meaning in face-to-face context" (SPOI3.1). Talal discussed the same belief:

I feel that face-to-face communication with the teacher and with other group members in traditional classes is better than in the online course. I believe that verbal form is better than written form to deliver information. Communicating over Internet is no more than words on the computer screen. I mean emotions can't be read through written communication. I think that I need more time to be comfortable to be engaged in an online learning environment (SII29.11, SPOI3.1).

Cultural or contextual factors of communication

Students' beliefs about communication would be related to cultural/social factors as well as learning experiences. These beliefs along with limited access to technology are likely to impact upon and shape how students engage in group collaboration and interact with the teacher. Table 6.5 presents students' comments about communication and the related cultural/social and contextual factors.

Table 6.5 Cultural/social and contextual factors of students' communication.

Contextual factors	Social factors	Cultural factors
<p>1. Technological difficulties inhibited learning (slow Internet speed and lack of computer access in the computer lab).</p> <p>Examples:</p> <ul style="list-style-type: none"> - Adham "technological difficulties such as slow Internet speed and lack of computer access in the computer lab constrained the group members' communication to finalise the task" (SII29.11) (Interviews data). - Asem "I notice that there is a lack of communication between the members. This may be because of slow Internet speed" (SPOI3.1) (Interviews data). - Talal "a lack of computer access in the computer lab and difficulties to access the online tools on Bb system, especially the discussion forum and the chat tool limited the group members' communication" (SII29.11, SPOI3.1) (Interviews data). 	<p>1. Students were more experienced in direct communication with the teacher and with other students. (Lack of exposure to using Internet for learning).</p> <p>Examples:</p> <ul style="list-style-type: none"> - All three group members reported that they had engaged in face-to-face instruction in high school and at the university and they have not used the Internet for learning or educational purposes (SPI4.10) (Interviews data). - Talal "I think that I need more time to be comfortable to be engaged in an online learning environment (SII29.11, SPOI3.1) (Interviews data). <p>2. Students experienced problems in understanding ideas and sharing information in the online discussion.</p> <p>Example:</p> <p>The three group members identified that they have problems of fully understanding the ideas raised in the discussion forums (SII29.11, SPOI3.1) (Interviews data).</p>	<p>1. Students preferred face-to-face communication rather than online communication.</p> <p>Examples:</p> <ul style="list-style-type: none"> - Adham "I feel that face-to-face communication is the key to success in completing the task" (SII29.11, SPOI3.1). - Talal "I prefer to be engaged in face-to-face communication" (SII29.11, SPOI3.1) (Interviews data). - Asem "I feel that I am more likely to complete the task when I am encouraged to be engaged in face-to-face communication with the teacher and other students" (SII29.11, SPOI3.1) (Interviews data). <p>2. They believed that the oral form is better than the written form to deliver information.</p> <p>Example:</p> <p>Talal "I believe that verbal form is better than written form to deliver information. Communicating over the Internet is no more than words on the computer screen" (SII29.11, SPOI3.1) (Interviews data).</p>

	<p>3. Immediate feedback from the teacher and other students was expected in face-to-face communication.</p> <p>Example: Talal "face-to-face communication is a better opportunity to ask questions and receive feedback from the teacher and other group members than online communication because you will be provided with immediate feedback" (SPOI3.1) (Interviews data).</p>	data).
--	--	--------

In Arabic cultures, social and cultural identities influence each other, and there is an overlap between cultural and social aspects in society. In this study, the students were interviewed to examine their cultural/social backgrounds, and their beliefs about technology and collaboration to analyse their work through the online discussions. Therefore, this section presents a discussion of the issues described in Table 6.5 as cultural factors that could affect students' online communication.

Analysis of interview data showed that the group members were more inclined to engage in face-to-face communication rather than online communication because they believed that face-to-face communication is more preferable than written communication. For example, Talal reported "I prefer to be engaged in face-to-face communication" (SII29.11, SPOI3.1), and Asem seemed to hold this belief when interacting with peers and with the teacher to finalise the task as he stated "I am more likely to complete the task when I am encouraged to be engaged in face-to-face communication with the teacher and other students" (SII29.11, SPOI3.1). Adham also further explained his preference for face-to-face communication as he stated "I

feel that face-to-face communication is the key to success in completing the task". (SII29.11, SPOI3.1).

Talal's comments reflect the belief that face-to-face communication is more preferable than online learning. He stated that the verbal form is better than the written form to deliver information. Communicating over the Internet is no more than words on the computer screen" (SII29.11, SPOI3.1). He was referring to the limited interaction that the computer allows. This belief suggests that there is more to communication than the transmission of information. In the group, Talal contributed the least to discussions. In the first task, he interacted with his peers in the discussion forum and attempted to develop the task with only one suggestion as he stated "I suggest to include one example of using technological tool in Education such as visual tool instead of different examples" (CT1A5.11), (Post 14).

It is important to examine how the students expected to receive feedback from the teacher and other students in the group in order to complete the tasks. Feedback is crucial to improve student thinking, motivation, and learning. The group members held different views with regard to feedback provision. For example, Talal commented that:

face-to-face communication is a better opportunity to ask questions and receive feedback from the teacher and other group members than online communication because you will be provided with immediate feedback (SPOI3.1).

Conversely, Asem said "I think that online communication with the teacher and with other group members are good. I feel more connected to other members and personalised feedback is expected" (SPOI3.1). This could explain the student's engagement in group work and their contributions with regard to initiating task process by providing information to keep the group on track and develop the task by suggesting alternatives for the tasks (CT1A29.10, CT1A5.11, CT2A3.12).

The three group members identified that they have difficulties in organising thoughts and sharing information through the online discussions, and problems of fully understanding the ideas raised in the discussion forum (SII29.11, SPOI3.1). These issues may have resulted in the incomplete conversations in the discussion forum for both tasks. In part, these difficulties can be explained through the students' lack of experience using these types of tools to support learning as well as a lack of experience in collaborative tasks.

The three group members reported that they had engaged in face-to-face instruction in high school and at the university and they have not used the Internet for learning or educational purposes (SPI4.10). Talal also identified " I think that I need more time to be comfortable to be engaged in an online learning environment" (SII29.11, SPOI3.1). This resulted in the students' learning difficulties in understanding the ideas via the online discussions as Adham said "messages through online communication can simply be misunderstood" (SPOI3.1). Online communication did not seem to facilitate learning. The students believed that traditional face-to-face instruction was better than the online course.

Collaborative learning was restricted by limited access to technology. The students reported some technological issues that affected their communication in completing the tasks. For instance, Adham reported that "technological difficulties such as slow Internet speed and lack of computer access in the computer lab constrained the group members' communication to finalise the task" (SII29.11). Asem reported that there was a lack of communication amongst the group members to complete the task. He said:

I think, without doubt that the new collaborative learning environment provide us with a lot of advantages. It facilitates the information delivery in easy way to the student's mind and assists to realise the requirements of the task. However, I notice that there is a lack of communication between the members. This may be because of slow Internet speed (SPOI3.1).

Talal did not adequately participate with his peers, particularly to complete the first task and he appeared to be the least active member. This could be because of his low motivation or the technological restrictions that he reported:

a lack of computer access in the computer lab and difficulties to access the online tools on Bb system, especially the discussion forum and the chat tool limited the group members' communication (SII29.11, SPOI3.1).

Summary

The findings indicated cultural/social issues as well as contextual factors that were reported by the group members. These issues restricted communication amongst the members to complete the tasks. Students' believed that face-to-face communication is the means to success in completing their tasks, that the oral form is better than the written form for delivering information, and that feedback from the teacher and peers is more common face-face. Students' lack of experience using the Internet for learning and a lack of experience in collaborative tasks could explain incomplete conversations in the discussion forum and students' learning difficulties through the online discussions.

Students reported that difficulties with Internet and computer access in the computer lab restricted their use of the online tools in the Bb system. This also restricted their communication and collaboration. The students were asked to establish their own groups based on student friendships; it seemed that there was group cohesion in the illustrative group. In this example, Asem reported in the post interview that "I feel more connected to other members and personalised feedback is expected" (SPOI3.1).

Chapter 7

Discussion

Introduction

The purpose of this study was to investigate student collaboration in Saudi higher education through the use of online collaborative tools to compliment face-to-face experiences offered. This study aimed to examine how these tools may support student learning through group tasks orchestrated and completed within an online learning environment. Throughout the reporting of the two iterations of this study, particular attention had been paid examining student activity to begin to understand the contextual and cultural factors that supported or hindered student learning in the blended learning environment.

The participants included in this study were from two cohorts of fifteen education students in a first year IT class at King Faisal University (KFU) in Saudi Arabia. These cohorts reflected the two iterations (each bound by a teaching semester of fifteen weeks) of the study. This chapter provides a discussion of the major findings in response to each of the research questions, presents principles for the use of collaborative tools in Saudi higher educational contexts, and makes recommendations for future research in similar fields.

Discussion of Research Question 1

How can collaborative tools support students' learning in a higher education technology subject in Saudi Arabia?

In examining this research question, the participants as collaborative learners and the practices revealed during their interactions with the collaborative tools will be discussed.

The participants as collaborative learners

This section examines how the student participants engaged collaboratively to make meaning to complete the tasks. They were required to discuss and complete two group tasks using the online collaborative tools. The first task was to create a website showcasing technology use in Education. The second task was to either create a podcast about using synchronous/asynchronous tools in Education or develop a video narrative about using mobile phones in Education.

The student participants identified that they had experienced face-to-face teaching and learning environments in high school. At KFU, they felt that they were passive learners in the classroom, and identified they had not previously engaged in any kind of online collaborative learning (SPI6.3, SPI4.10). Throughout this research, the participants found it difficult to deeply engage in the processes of collaboration to complete their tasks. The knowledge and understanding demonstrated by the students throughout the interaction with the online tools and tasks were unchanged from the initial discussions posted in the online tools, and this finding was consistent in all groups across both iterations. This suggests that student collaboration through the tools did not adequately support students to strengthen their responses to the tasks through their interactions with the collaborative tools. This result is in contrast to McConnell's (2002) findings, that student knowledge and understandings of the task are developed through student online discussions to create a product for a group project (Barb et al., 2001; Fischer et al., 2007; Jonassen et al., 1995; King, 2007; Uribe et al., 2003).

Data showed that these students did collaborate in the discussion forum as they completed the tasks, however, they did not use the collaborative tools to develop ideas. This result is in contrast to other claims that collaborative tools such as chat, email, and discussion forums can be used to enhance student collaboration and idea development during online discussion (for example, McKnight, 2004; Simonson et al., 2009). It is also in contrast to other studies that found students preferred to use

synchronous and asynchronous tools to develop ideas while completing their group tasks (Gunawardena et al., 2001; McLaughlin, 2002). The students' interview responses indicated that they preferred to work in face-to-face environments. The student participants had 11 face-to-face meetings for an hour after the lecture each week, between weeks 3-13. These students were asked to discuss the task requirements face-to-face before using the online tools in Blackboard. Although the students were provided with face-to-face input, supported by the online learning environment (blended teaching and learning), their online interactions and final works provided little evidence of collaboration. This could be explained by the students not understanding the task requirements, or because they may have found the requirements difficult (as presented in the findings chapter of iteration 1), or perhaps they found it difficult to find the time or prioritise working together to complete the tasks.

Reflection on the first iteration led to the incorporation of additional teaching structures in the second iteration to support student learning (meaning-making). Key questions were posed weekly in a scaffolded way to help the students think about the task more deeply. In addition, the student participants were provided with continuous feedback and comments on their responses in the discussion forum, and a weekly reminder was sent to the students' emails on Blackboard to encourage them to use the online tools for their discussions. However, the final tasks did not reflect engagement with collaborative structures. For instance, the student participants from the illustrative group defined the term of technology in the discussion forum for the first task as "the tools that are used in the classroom by the teacher" (CT1A29.10, Post 3). This definition was reflected in the final task (website) with limited detail as "different tools that can be used to support teaching and learning process in several educational settings" (CT1B19.11). This indicates that student collaboration did not really support students to advance their understanding while completing the collaborative tasks.

The student participants did not progress past agreement statements in the discussion forum to demonstrate their understanding. They agreed with peers about different topics in the discussion (about task processes or suggestions on how to complete tasks), but they did not develop the ideas further by posting messages to elaborate on their understanding of the topics. They tended to change the discussion on a particular topic after the agreement statement. For example, in the second iteration, Asem agreed with Adham to stress on the reasons for using technology in Education within completion of the first task, but he did not demonstrate his understanding by expanding on this topic after his agreement when he stated "I agree with Adham to stress on the reasons for using technology in Education" (CT1A29.10, Post 6). He switched the discussion to the topic of the advantages and disadvantages of using technology in Education as he stated "I think it is important to include the advantages and disadvantages of using technology in Education" (CT1A29.10, Post 7).

These findings are in contrast to Hathorn and Ingram's claim (2002) that many ideas are developed through mutual discussions in the online collaborative learning environment, and Valacich, Paranka, George and Nunamaker (1993) who found that participation in online collaborative learning contexts prepared students to actively work and to generate and develop unique ideas within a specific period of time. In the current study, the students did not show that their understanding developed through participation with the collaborative tools. This could be justified by the students' lack of experience interacting in an online collaborative environment, with group members reporting the difficulties experienced with sharing information and delivering information via the online tools as well as problems of fully understanding the ideas posted in the discussion forum (SII29.11, SPOI3.1).

The findings of this study indicated that student participants did not make meaning and demonstrate understanding of the tasks within their discussion through their engagement with the online tools. Their knowledge and understanding in the final tasks appeared unchanged from their initial views, as the ideas were not developed further. This could be explained by the students not making adequate use of the tools

because it was the first time that they had used these tools for educational purposes, or because they did not fully understand the task requirements. This could also be interpreted as students' unwillingness to be engaged with the tools within the collaborative learning environment. This aligns with the findings of Al-Harthi's study (2005) who found that Arab students' understandings in the online learning environments were influenced by their learning backgrounds. Al-Harthi (2005) found that Arab students were less likely to be engaged with online tools as they found it difficult and anonymous because of their lack of enthusiasm for online learning.

Participant practices during interaction with collaborative tools

The student participants' use of the collaborative tools provided in the online learning environment (Blackboard) to support their collaboration while completing the tasks is described and discussed.

In the discussion forum, students' responses were consistent with a lack of detail and limited elaboration. In the first iteration, discussion about task processes was the most frequent activity ($n=39$), followed by agreement statements ($n=35$). Disagreement statements had the lowest frequency ($n=7$).

The participants collaborated with peers to define the task, discuss the task, suggest alternatives to develop the task, and agreed with other group members to confirm one or more of these activities. However, elaboration in their online discussions was limited. To illustrate, the participants from group B (Meteb, Ammar & Khalid) in the first iteration, had limited engagement and shallow contributions in response to creating a website for the first task while providing information about the topics (task process and suggestions) such as the importance of the use of technology in Education and the reasons for using technology in Education. In the discussion forum, Meteb attempted to steer the group to the task process and encouraged participation by stating "We should focus on the importance of using technology in Education and we need to stress on the student learning" (CT1A12.3, CT1A17.3).

However, none of the group members continued the discussion about task processes. Instead, the group went to another topic by suggesting alternatives, as Khalid stated "I suggest to stress on the reasons for using technology" (CT1A17.3). These findings are not supported by the findings of Gunawardena et al.'s (2001) study, which found that students engaged deeply using discussion forums to reflect and provide comments on their collaborative tasks at flexible times (McLaughlin, 2002). The lack of interaction between students in the present study can be explained by these students not having adequate experience in collaborative learning to complete their task. This could result in them finding it difficult to deeply discuss the topic in the discussion forum.

Student collaboration for the second task in the discussion forum was also limited. For instance, Meteb initiated discussion about task processes and tried to open discussion by stating "Email is the most common tool in the Internet. It can be used for multiple purposes such as communication, education, as well as news" (CT2A16.4). Interestingly, none of the group members provided more detail to continue the discussion on this topic "email as learning tool". This student then switched the group discussion to another topic, and stated "Email is the important tool of communication and its benefits are several. People can build their social relations such as friendships by using email regularly" (CT2A30.4). This lack of discussion about "email as learning tool" could reflect students' lack of using email as a collaborative tool to complete their tasks. This builds upon the earlier argument that the students' lack of experience using collaborative tools for learning has impacted on the findings of this study.

Unexpectedly, the participants' collaboration was as limited in the second iteration as it was in the first iteration. In response to the first iteration, teaching adjustments were made (including continuous feedback and encouragement for participation), yet this did not improve forum postings. Analysis of the discussion forum revealed that the conversations were incomplete and responses were consistent with a lack of detail. In the second iteration, discussions about task processes was the most frequent

activity ($n=9$), followed by suggestion statements ($n=8$) while task definition was the least frequent activity ($n=1$) used by the students.

The participants from the illustrative group (Adham, Asem & Talal) collaborated with each other and discussed different topics (task process and suggestions) in response to the first task (creating a website), but their discussions were limited and had insufficient information. Within this instance, Adham tended to steer the group to the task processes by elaborating on the term of technology in Education as he stated "The term of technology in Education has a wide meaning. This term could include the tools that are used in the classroom by the teacher" (CT1A29.10, Post 3). Following this, none of the group members provided feedback or comments on Adham's statement to keep the discussion going. Instead, Asem changed the topic by stating "The use of technology in Education enhances the all elements of the learning process" (CT1A29.10, Post 10). In a similar way, the group members discussed task processes and attempted to develop the task process by providing information about various topics and suggesting alternatives in the discussion forum in response to the second task (producing a podcast).

The findings of this study revealed that the discussion forum was the most used tool by group members in both iterations because it was required. This indicates that the asynchronous tool could relatively support student collaboration in this study if the use of this tool was mandatory in the subject. The student participants used the discussion forum in both iterations as the main tool for their task discussions. Analysis showed that there were 248 posts from the student participants in the discussion forum to interact with the teacher and with their peers. They replied to the teacher's questions provided in the discussion forum to help them initiate collaboration and think about the topics of the tasks. It was expected that these questions will assist the students to realise the issues related to technology in Education as well as the use of technological tools in Education. For example, one participant in the first iteration posted "technology tools break the barriers between the teacher and students, and motivate the students to learn more" (DT2.4).

Based on the analysis of students' interaction, the participants worked together to define the tasks, discuss task processes, suggest alternatives and solutions to develop the tasks, and agree with peers to confirm these processes in order to complete their tasks in the discussion forum. These findings are supported by the study of Gunawardena et al. (2001) who found the students preferred to use asynchronous tools to complete their tasks because these types of tools provided flexible time where the group members can read, reflect, and write their responses on the discussion forum at any time. Similarly, McLaughlin (2002) found that undergraduate students actively used the discussion forum to complete group work tasks in the online learning context (Chen et al., 2006). In the present study, the high frequency of participation in the discussion forum compared to other online tools in Blackboard could refer to the assigned participation requirement (five postings for each student) to discuss the tasks, or this might be because the students frequently use public discussion forums as they identified in the interviews (SPI6.3, SPI4.10) as presented in the findings chapter. Therefore, the students appeared to have become familiar with the use of the discussion forum in Blackboard. Based on the findings revealed in the present study, it would likely be that the discussion forum could not adequately support student participants' collaboration.

The findings of this study revealed that the chat tool was less frequently used by the group members within their groups in both iterations. This tool was designed for synchronous interaction to enhance student collaboration and discuss the requirements of the tasks or specific subject content. The student participants were also encouraged to use this tool to facilitate group meetings. Analysis indicated that 14 students in the first iteration, and the three group members from the illustrative group in the second iteration, aggregated 113 responses with the teacher and peers. For instance, one participant in the second iteration asked the teacher about the task requirement by stating "I have understood that every group member should participate in five responses related to the topic... Can you please explain how to discuss topics between the group members?" (Lines 5-15). Another participant discussed the direction of their task response "We decided to focus on the definition

of the use of technology in Education on our website and we will discuss other related topics ... What do you think guys about this?" (Lines 10-16).

Despite a minimum participation requirement in the chat space (five postings for each student) being assigned in the second iteration, the participants used the chat tool less frequently than the discussion forum. This could be because these student participants preferred to use the discussion forum as it provides flexible time for reading and posting (Gunawardena et al., 2001) or because it was required to complete the tasks. This could also be because of students' lack of experience using the chat tool (synchronous tool) in collaborative learning, or because the student participants used other forms of communication for synchronous interaction, such as face-to-face meetings or mobile phone contact. In addition, the analysis of the chat tool data showed that the students did not use this tool for group meetings, which may have been because they could meet face-to-face in the classroom. In the current study, I attempted to support the participants' interactions with the chat tool through the assigned participation requirement as per requirements for the discussion forum. However, student responses found in the chat tool were less frequent than those in the discussion forum. This indicates that the chat tool as a synchronous tool did not sufficiently help the students in supporting their collaborative learning in this study, even though the use of this tool was mandatory in the subject.

The findings of this study revealed that the email tool was the least frequently used tool by the group members in both iterations. This tool was designed as an optional asynchronous tool to support student collaboration in order to complete the tasks, and for contact with the teacher for specific subject related inquiries. Analysis indicated that there were 15 messages from 5 participants in the email tool to interact with the teacher only in the first iteration. For example, one participant sent a message to the teacher reporting that there was a lack of collaboration between the group members and difficulties in communication as he stated "My group members have late postings which may cause difficulties in the task submission on the due date" (ET17.3). Another participant sent an email to the teacher asking about how to use

the submission tool on Blackboard, as he found it difficult to access the tool (ET17.3).

Analysis of the email tool data reveals that the participants did not use this tool for task discussion. Instead, they used it to make contact with the teacher regarding specific questions or inquiries. In the second iteration, the teacher sent a weekly message to the students' emails on Blackboard to remind them to use this tool for collaboration, yet none of the group members used this tool for interaction. This could be explained by the use of this tool being optional, or because the students preferred to use the discussion forum for asynchronous interaction due to the flexibility of reading and responding (Gunawardena et al., 2001). This could also be because the students used their personal emails for interaction rather than the tool provided on Blackboard. This indicates that the email tool as an asynchronous tool did not efficiently support student collaboration in this study. These results do not align with the findings of Poole's (2000) study, which found that students preferred to utilise email instead of chat or the discussion board for their group work in the online collaborative learning environment. As the current study was conducted in a blended learning environment, it would likely be that the participants used other forms of communication or other tools for collaboration in synchronous and asynchronous environments that could not be measured, such as face-to-face meetings, social network websites, or personal emails. The student participants reported using the Internet for ten hours or more a week for checking emails, general browsing, and for maintaining personal Facebook accounts (SII29.11, SPOI3.1). It seems reasonable to suggest that they may have used these forms of communication rather than the online tools provided in Blackboard.

Despite additional teacher support and the expectation of enhanced online collaboration, the student participants' collaboration remained unchanged across the two iterations. The discussion forum was the most used tool by the students, followed by the chat tool, and then the email tool, which was the least used tool. This

suggests that students did not see the potential in these collaborative tools to support collaborative learning.

Discussion of Research Question 2

The purpose of the second research question was to explore:

What are the contextual and cultural factors that support or inhibit students' learning in a blended learning course in Saudi Arabia?

To respond to this question, contextual and cultural factors for the participants in their context are examined. The discussion examines the limited student engagement with the online collaborative tools as they engaged with subject materials to complete the assigned tasks. Such findings from the two iterations of this study are examined in connection with Hofstede's (1980, 2001) dimensions of culture, and Hall's (1966, 1976) theory of contextualisation (introduced in Chapter 2).

Contextual and cultural factors underpinning the student experience

This study has reported on the experiences of fifteen education students in a first year IT class (across two iterations) as they engaged in the *"Producing and Using Instructional Tools"* subject at KFU. Specific contextual and cultural factors will be explicated.

Contextual factors

Technological difficulties and a lack of group cohesion experienced by the students in both iterations of the blended learning course were found. These factors are

analysed and discussed in correspondence with Hall's (1966, 1976) theory of high- and low- contextual cultures.

Technological difficulties

Hall's (1966, 1976) theory of contextualisation reveals that context is a key factor. This refers to backgrounds, frameworks, or surrounding situations that take place in an interactive environment. Both iterations of the study were conducted in a computer lab equipped with fifteen PCs with Internet access for the student participants throughout the teaching sessions.

Despite making contact with the Education Technologies Department in the Faculty of Education and eLearning Deanship at KFU, and informing them of technical problems reported by the students, these issues remained unresolved throughout the iterations. Within both iterations, the students reported a lack of Internet and computer access in the computer lab, and difficulties accessing the online tools on the Blackboard system, as factors that limited their interaction.

Such technological problems could explain students' lack of engagement in the collaborative online tools in both iterations. These results are aligned with previous studies (Alarfaj, 2001; Alaugab, 2007) which indicated technological difficulties such as a lack of Internet access, lack of equipment and infrastructure, and lack of technical support (sever, network and power, etc) were limiting for undergraduate students in Saudi universities. In the current study, technological problems including a lack of Internet and computer access in the computer lab, and difficulties to access the online tools on the Blackboard system, were contextual factors that inhibited students' interacting to complete their online collaborative tasks.

Lack of group cohesiveness

According to Hall's (1966, 1976) contextualisation, Arab countries are categorised as high-context cultures. This indicates that people from these cultures appreciate interpersonal relationships and prefer group harmony (Hall, 1966, 1976). In this study, lack of harmony between students in groups was a contextual factor that limited student collaboration.

The findings of this study revealed that three students from three groups (B, D & E) in the first iteration reported a lack of group cohesion. They identified that they experienced a lack of harmony within their groups, and that this restricted them to share knowledge and build new intimate relationships between group members (JT26.3, SII10.4, SPOI29.5). For example, Tareq from group D stated that "lack of harmony and difficulties in communication between the students limited the interaction between the members to complete the task" (JT26.3). Additionally, Saad from group E commented "difficulties in communication with the other members due to lack of harmony constrained the completion of the task" (JT26.3).

This lack of cohesiveness may be because the students live in different cities or because they do not know each other. This contextual factor could explain inadequate student collaboration to complete the tasks, particularly in the first iteration. Therefore, in the second iteration, the student participants were asked to establish their own group based on student friendships. It was hoped that this method would enable group cohesion, and it seemed that there was a harmony between the group members because none of the members reported difficulties in communication due to a lack of group cohesion. In the illustrative group, Asem identified that "I feel more connected to other members and personalised feedback is expected" (SPOI3.1).

Cultural factors

Collectivism

Hofstede (1980, 2001) classifies Arab cultures as collectivist. Learners from collectivist cultures often prefer to learn and work within group, and they focus on the product to maintain social status. They also prefer to be engaged in one way communication (Hofstede, 1980, 2001; Bauer et al., 2000). The findings of this study partly align with Hofstede's (1980, 2001) collectivism dimension of Saudi students.

As discussed in response to the first research question, although student collaboration was limited across both iterations in this study, the student participants did collaborate with each other to complete the tasks. The findings revealed that the participants did accomplish the assigned collaborative tasks as they were required in the discussion forum, but their engagement in collaboration was not in depth. Despite the students not collaborating with each other to complete the tasks, they did attempt to orientate the group to the task and encourage participation. For example, in the first iteration, Meteb tried to enhance group work and reiterated how to finalise the product for the first task in the discussion forum. He stated "We should focus on the importance of using technology in Education and we need to stress on the student learning" (CT1A12.3, CT1A17.3). In the second iteration, Adham also tended to steer the group to the task and open the discussion. In the discussion forum, he elaborated on the term of technology in Education by stating "This term could include the tools that are used in the classroom by the teacher" (CT1A29.10, Post 3). These examples suggest that the participants seemed to be collectivist-oriented through their online group work. This reflects that Saudi students are likely to be socially and psychologically connected with each other in the learning environment, which is characteristic of collectivist cultures (Hofstede, 1980, 2001; Bauer et al., 2000). In collectivist cultures, one way communication of learning in the learning environment is emphasised. In the current study, the participants' apparent lack of experience using collaborative online tools to complete tasks could explain their limited engagement in collaboration and meaning-making. Although, some students

identified that they were enthusiastic to be engaged in group work, they found it hard to participate in the collaborative approach in the online learning environment due to their lack of experience using collaboration. In the first iteration, six students reported that they were very motivated to participate in this study, as this was a new experience for their learning. At the same time, they were worried that they had not engaged in any kind of collaborative learning environment (JT12.3). For example, Meteb commented on his experience in collaborative learning environment by stating:

I am excited for the new experience of collaborative learning and the use of online tools, but I find it difficult to deal with them, especially using discussion forum... because I have not used it before (JT12.3).

In the second iteration, the three students from the illustrative group identified that they have difficulties in organising thoughts and sharing information through online discussions, and problems of fully understanding the ideas in the discussion forum (SII29.11, SPOI3.1). These findings are in contrast to the previous study of Uribe et al. (2003), who found that group members in online collaborative environments actively support each other to complete the task and make extra effort to achieve their goal. They found that students attempted to create proper opportunities for interaction within group work in the online learning environment to solve a problem on the task. Similarly, Chen et al. (2006) found that students who engaged in group work within online collaborative learning contexts were deeply involved in their discussions. Their study found that participants preferred to initiate dialogue, comment on other's posts, and actively ask questions and interact with peers. They also tended to critique or restate messages posted by the other group members before commencing their arguments. In the current study, this could be interpreted as the absence of collaborative group roles among the group members to complete the task where the group leader did not take on a leadership role to steer the group to the task process and guide the group discussion. They did not allocate other roles among the members, did not urge peers for group meetings in the chat tool, and did not encourage other group members to use the email tool for group discussion. This

indicates that in the present study, there was a lack of student experience in collaborative tasks because of their cultural backgrounds and the one way communication stream of learning in a collectivist culture, which could explain their limited collaboration and meaning-making.

The participants' lack of exposure to using the Internet for learning could restrain their engagement in online collaborative learning environments and in meaning-making. The interview responses show that the student participants in both iterations identified that they had experienced face-to-face learning environments in high school and at the university as passive learners in the classroom (SPI6.3, SPI4.10). However, the students did suggest familiarity with online environments. For example, 12 students in the first iteration and the three members from the illustrative group in the second iteration reported using the Internet for about ten hours a week for general browsing, checking emails, participating in public discussion forums, and for maintaining personal Facebook accounts, but none of them identified having used the Internet for learning or educational purposes (SPI6.3, SPI4.10). Talal explained his belief about the use of Internet for learning as "I think that I need more time to be comfortable to be engaged in an online learning environment" (SII29.11, SPOI3.1).

The student responses indicate that these students have not engaged in online learning environments during their educational journey. So, they did not have adequate skills to use online tools for learning or educational purposes. This result is supported by the findings of Al-Harthi's (2005) study, which found that Arab students were influenced by their cultural backgrounds within their engagement in the online learning context. Arab students were less likely to be engaged in an online learning course because of their sole experience of traditional face-to-face instruction. This also relates to the Saudi students' use of online tools for learning in this study. The findings suggest that the student participants were influenced by their cultural backgrounds of one way communication of learning, and they were less likely to be engaged in the online learning context. Thus, this could be interpreted in

the present study as limited student collaboration and meaning-making in the online collaborative learning environment

Power Distance

Hofstede (1980, 2001) indicates that Arab countries maintain a high level of power distance. Students in high power distance cultures rely on the teacher for their learning, and they expect to be informed what to do. They see the instructor as the sole authority who transfers knowledge to students in the learning environment (Hofstede, 1980, 2001; Bauer et al., 2000). The findings of this study correspond with Hofstede's (1980, 2001) power distance dimension of Saudi students.

Despite the student participants being motivated to participate in group work within the online learning environment, they believed that teacher supervision is important to support their learning. For instance, one participant identified "I am excited to use technology tools on Blackboard. I think collaborative learning is useful for students, but the teacher should supervise us" (JT12.3). In addition, feedback is important to be explored within students interaction while completing that tasks because it enhances student thinking and learning behaviour. In the current study, the findings show that the students believed that feedback from the teacher is important for their learning and they expected to receive more face-to-face interaction which was more available through direct communication than online learning environment. This could be explained by the participants' backgrounds of learning via one way communication rather than from an online environment. In the first iteration, the fact that the student participants were provided with alternatives resources such as hard copies of the subject outline, and references to books and online readings to attain information about the topics, they did not use the reading resources provided and they appeared to obtain the information from the teacher only (RJ16.4, RJ4.6). Five students reported that they preferred not to be engaged in group work and they tended to discuss and interact with the teacher only (SPI6.3). In the second iteration, Talal from the illustrative group identified that face-to-face learning "is a better

opportunity to ask questions and receive feedback from the teacher..... because you will be provided with immediate feedback" (SPOI3.1). This result aligns with Al-Keaid's (2004) claim that typical Saudi classrooms include learners who believe that the teacher is the only leader and has the sole right for monitoring the teaching and learning process.

In the current study, students reflected a level of high power distance through their interaction while completing the tasks (Hofstede, 1980, 2001). They preferred communicating with the teacher face-to-face rather than deeply collaborating with each other and posting online for discussion. Thus, limited collaboration and meaning-making within their completion of the tasks could be explained due to students' cultural backgrounds of teacher-centered learning environments.

High Uncertainty Avoidance

Limited student engagement in collaboration and meaning-making in this study could also be explained through Hofstede's (1980, 2001) uncertainty avoidance dimension. He shows that Arab countries have high uncertainty avoidance. This means that people from these cultures are more worried about uncertain or unknown circumstances and need written or unwritten rules for predictability (Hofstede, 1980, 2001). In the learning context, students prefer structured learning environment with precise goals and detailed assignments, and they consider the teacher as the expert who has knowledge and all of the answers (Hofstede, 1980, 2001; Bauer et al., 2000).

The findings of this study indicate that the student participants' uncertainty was the source for their worries about engagement in collaborative learning in the online learning environment (Al-Harthi, 2005). This could be explained by the students' lack of experience using collaboration and online tools for learning, as it was for their first time. In the first iteration, six students identified that they were worried to participate in this study because they have not engaged in any kind of collaborative

learning or online learning environment, and their participation in this study was a new experience for them (JT12.3). In the second iteration, none of the students from the illustrative group reported having used the Internet for learning or educational purposes (SPI4.10). This lack of experience could increase students' anxiety and resistance to use collaboration and online tools for learning, which reflect Hofstede's (1980, 2001) uncertainty avoidance dimension.

Masculinity

Hofstede (1980, 2001) claims that Arab countries are masculine. In their learning environment, students' performance and achievement are appreciated (Hofstede, 1980, 2001; Bauer et al., 2000). As the participants of this study were male students in Saudi Arabia, they attempted to appear visible and collaborate with each other to complete their tasks, however, their collaboration was limited.

As discussed in response to the first research question, the student participants did collaborate with each other in the discussion forum to define the tasks, discuss the tasks, suggest alternatives to develop the task, and agreed with peers to confirm one or more of these activities, but their interaction was not sufficient for deeper collaboration. The findings show that their contributions were consistent with a lack of information and inadequate detail. This was the case of the student participants' online discussion in both iterations. This could be explained because of students' lack of experience using collaborative learning and online tools, which indicates their limited engagement in collaboration and meaning-making in the current study.

Short-Term Orientation

Hofstede (2001) claims that traditions in Muslim countries are sacrosanct, and they should be respected with any change for modernity in the future. This relates to collaboration and online learning when their use conflicts with these traditions in the

learning environment. The findings of this study indicate that the student participants' preference for face-to-face instruction in traditional classrooms could explain their limited collaboration and meaning-making while completing the collaborative tasks.

The three participants from the illustrative group in the second iteration reported that they prefer to be engaged in face-to-face instruction to complete the tasks (SII29.11, SPOI3.1). Asem identified "I feel that I am more likely to complete the task when I am encouraged to be engaged in face-to-face communication with the teacher and other students" (SII29.11, SPOI3.1). Talal also expressed the similar belief as he stated "I feel that face-to-face communication with the teacher and with other group members in traditional classes is better than in the online course" (SII29.11, SPOI3.1). The students' responses indicate that these students were more motivated to be engaged in a face-to-face learning environment than online learning. This can be interpreted by the limited student collaboration identified in this study. This result is supported by the findings of Almushaiqih (1993), who studied 94 undergraduate education students in Saudi Arabia. He found that around 75 percent of the students confirmed that the lecturing method was the most frequent method used in class, which was a preferable approach for teachers and students. This trend reflects the Saudi students' cultural and social backgrounds of learning as passive learners within face-to-face instructional environments. So, this could be the reason for their restricted collaboration in the present research.

High- contextual culture

Hall (1966, 1976) indicates that Arab countries are high-context cultures. In the learning environment, teacher-centered learning is emphasised with little focus on students' personal skills. Students in these cultures believe that knowledge is transferred by the teacher. Communication between teacher and students in high-context cultures tends to be more formal (Hall, 1966, 1976). In collaboration and online learning environments, informal communication, open discussion, and reciprocal interaction between teachers and students, and between students are

emphasised. This conflicts with the student participants' cultural backgrounds of face-to-face communication, which could explain their limited collaboration and meaning-making in this study.

The participants' preference for face-to-face communication could be explained by the students' belief about the importance of face-to-face interaction for learning. Adham explicated his belief as "I feel that face-to-face communication is the key to success in completing the task" (SII29.11, SPOI3.1). On the other hand, Talal discussed another belief when he described the computer as a device of information transmission, and the communication through the Internet may cause limited interaction. He emphasised his belief about face-to-face interaction as he stated "Communicating over Internet is no more than words on the computer screen. I mean emotions can't be read through written communication" (SII29.11, SPOI3.1).

Adham also commented on the same belief as he stated "face-to-face communication with other students is a better option because messages through online communication can simply be misunderstood as one written word can be explained by different meaning, but it can directly be interpreted in the precise meaning in face-to-face context" (SPOI3.1). These findings are in contrast to other findings of studies where students actively participated in online discussions through the online tools (Gunawardena et al., 2001; McLaughlin, 2002). This indicates that the student participants believed that face-to-face interaction is important for their learning, and oral messages are less likely to be misinterpreted. This could explain the limited student collaboration within the online learning environment in this study, which may have been due to too much dependence on written communication.

In the present study, a design-based research approach supported the research design as it helped identify the educational problems of collaboration with practitioners in the context of Saudi Arabia. It also assisted to develop and use possible solutions informed by technology and design principles to solve these problems. This approach worked with the action research methodology to conduct two iterative and reflective

cycles of a study to refine the solutions developed through the students' interactions. The analysis of data collected from the participants including their interaction patterns in both iterations allowed me to develop an understanding about collaboration within the online learning environment in Saudi Arabia. Furthermore, the analysis of data collected in alignment with Hofstede's (1980, 2001) culture dimensions and Hall's (1966, 1976) high- and low-contextual cultures assisted in deeply understanding the contextual and cultural factors that could influence Saudi students' collaboration in the online learning environment.

Principles for the use of collaborative tools in Saudi higher education

Based on the findings in response to the research questions, it is necessary to indicate that there are general principles that could be considered when the collaborative tools are used in Saudi higher education. These principles consider students' learning through their collaboration and teaching practices used such as collaborative tools, task definition, and the subject content. The cultural and contextual factors addressed in this study are also considered. The main goal of these principles is to improve the learning experience for Saudi students in online environments. So, they can benefit from a flexible and collaborative learning experience, particularly when they are engaged with online collaborative tools. The principles are discussed below.

1. Supporting meaning- making through collaboration

As discussed, in response to the first research question, the student participants did collaborate, but at a very superficial level. This will impact on their capacity to create and share meaning in the online space. There are a number of considerations relating to how this can be identified and supported in the learning environment.

a. Consideration of students' learning experience

The students' learning background of traditional learning could influence students' learning in Saudi higher education. This may obviously appear when collaborative tools are used in the learning environment. As discussed previously in this chapter, the findings of this study showed that the students' preference for a face-to-face learning environment, and their lack of experience in collaborative tasks, particularly in interacting with online collaborative tools, could clearly explain their limited collaboration in this study. This case was not unexpected, especially in terms of the lack of interaction through the online tools (Al-Harthi, 2005).

The findings of this study also reported that the students' lack of using the Internet for educational purposes could lead to the students' lack of interaction with the collaborative tools used in the current study. This lack of interaction could refer to the students' lack of experience using the Internet, or could refer to the teacher's authority of learning in the educational settings in the all levels of education in Saudi Arabia (Al-Keaid, 2004). This also could refer to a high level of uncertainty avoidance and change resistance in the educational situations which could impact on students' learning (Hofstede, 1980, 2001). From the above, I suggest that the applications of online collaborative tools in a Saudi higher education context should be simple, scaffolded by the teacher and adaptable with the traditional cultural norms of Saudi Arabia.

b. Consideration of teachers' practice (tool selection, task definition and the subject content)

An appropriate collaborative tool used in the Saudi higher education context could positively support student collaboration. The findings of this study revealed some indications that could be considered when collaborative tools are used within an online learning environment. For example, the results showed that the discussion forum was the most used tool by the student participants for interaction in both

iterations. However, the group members used the chat tool less frequently than the discussion forum (Gunawardena et al., 2001). This could indicate that asynchronous tools are most preferred for collaborative learning environments in the Saudi higher education context. Given the participants access and familiarity with technology, the asynchronous tools may have more closely represented traditional learning tasks.

The findings of this study also revealed that if participation in a collaborative tool is required, then a high frequency of student participation will result. However, low frequency of student participation was recorded when the participation in a collaborative tool was optional. In this instance, the high frequency of participation in the discussion forum compared to other online tools in Blackboard could refer to the assigned participation requirement (five posts for each student).

In addition, I suggest that the subject content should be appropriate for use with the online collaborative tools. In addition, the subject content presented in the online collaborative tools should be appropriate for use with online tools and for the students' individual differences. The findings of this study indicated that the student participants found it difficult to find the adequate time in order to complete the tasks because of the long requirement (500 words). The students' responses in the discussion forum revealed that students' knowledge and understandings demonstrated in the forum were not transferred to the final tasks. This could be explained by the students not fully understanding the task requirements because the content was difficult for them or a possible mismatch between the genre of a forum and what was required in the task. In addition, the timing of subject content presentation through the online collaborative tools should be considered. It is likely that the duration of fifteen weeks for the semester could be too long for successful use of the online collaborative tools, especially in the Saudi higher education learning environment.

2. Addressing cultural and contextual factors

a. Cultural factors

As discussed in response to the second research question, the findings reported that students' preference for face-to-face learning, their lack of experience using the online tools for learning, and their lack of using collaborative learning were the cultural factors influencing students' interaction in this study. The findings indicated that these factors play an important role to limit student learning and collaboration, especially when online learning takes place in the Saudi higher education context. These cultural aspects found in this study reflect expected student learning experiences from general education, as well as their social lives and families at home, and how some of this is transferred to tertiary education. This clearly appeared when the students identified that they had not used online tools for educational purposes, and their experience of online learning in this study was for the first time. Therefore, I emphasise the importance of initiating online learning with special attention to collaborative learning in general education in Saudi Arabia to provide students with adequate experience of online collaborative learning before their transition to higher education.

b. Contextual factors

Providing appropriate technical support in the Saudi higher education context is an important contextual factor to enhance student collaboration through the online collaborative tools. The findings of this study emphasised the importance of providing adequate technology for the use of collaborative tools within the online learning environment. Technological difficulties that were found in this study were related to Internet access, lack of computer access, and the difficulties to access the online tools on Blackboard (Alarfaj, 2001; Alaugab, 2007). I estimate that lack of appropriate technical support including lack of Internet access, and lack of

equipment and infrastructure impacted on student interaction, their responses and the ultimate success of the collaborative learning environments.

Recommendations for practice

This study provided an understanding of Saudi higher education students' learning through collaborative tasks within an online learning environment. This study found that student engagement in collaboration and meaning-making (learning) to complete the tasks was restricted. The limitation of student collaboration using the online tools could be explained due to contextual and cultural factors that were found in this study including students' preference for face-to-face instruction, their lack of experience using online tools and collaborative tasks, technological difficulties, and difficulties associated with group work.

The Ministry of Higher Education in Saudi Arabia should recognise the need for good instructional design in online learning to support collaboration. This can be implemented by taking serious action toward collaboration in online learning environments in Saudi classrooms. First, educating Saudi academic staff, policy makers, and general society about the importance of using the Internet for learning and collaboration. Second, encouraging academic staff to use online collaborative learning environments. Third, providing faculty members and students with equipped computer labs and adequate Internet access in each faculty. Fourth, providing faculties, departments, and students with a unit of technical support services at universities. Fifth, updating the curriculum to be appropriate for online instruction and collaborative learning. Sixth, providing Saudi universities and faculties with development program designers to supervise managing online courses. Finally, a focus on synchronous and asynchronous communication tools should be considered when designing online collaborative learning environments in Saudi Arabia.

Recommendations for future studies

To the best of my knowledge, the current study is the first to examine Saudi students' collaboration within their completion of collaborative tasks, and the first to explore the contextual and cultural factors that could support or inhibit their collaboration in a blended learning environment. However, this work toward similar application of online collaborative learning must be conducted to more fully understand how collaboration is best used in the Saudi classroom. It appears to be important that future studies are conducted to investigate the collaborative group roles between the members in an online collaborative learning environment in Saudi Arabia, and how these roles can support collaboration. The data collected from these studies will assist to understand collaborative roles in online learning environments allocated amongst students in order to enhance the way online students collaborate with each other. Studying the relationship between Saudi student motivation and their achievement in particular subjects within online collaborative learning environments will also be necessary for future studies. This will help to find out motivational factors that could support student collaboration within online learning environments.

In terms of the management perspective, conducting studies on Saudi faculty members and administrators and their cultural backgrounds towards applying online collaborative learning environments will be interesting topic for future studies. There are some suggestions regarding best future research for online collaborative learning in Saudi Arabia including: teaching strategies and effective learning in online collaborative learning environments; problem-based learning in online collaborative learning contexts; and exploring the relationships between Saudi education policies and student interaction in online collaborative learning environments. The data collected from such studies will help The Ministry of Higher Education in Saudi Arabia synthesise teaching, learning, and education policies in order to improve collaborative learning within online learning contexts in Saudi education.

Conclusion

This study concludes that the student participants did collaborate and perform the assigned online tasks, but their discussions were often incomplete. Moreover, the task responses consistently lacked detail. Students, across both iterations, exhibited limited development of meaning-making. This was most evident in limited transfer of input in the online tools to final work products. This study also revealed that the discussion forum was the most used tool, the chat tool was used less frequently, and the email tool was the least frequently used in both iterations.

This study was the first time these students had used these online collaboration tools for educational purposes. This study showed that the students did not make adequate use of the tools. They seemed unable to engage with them productively. Though they collaborated with each other, they did not use teacher and peer suggestions and feedback to develop their final tasks. This was true of both the iterations in this study.

Second, the study revealed cultural issues informed by Hofstede's (1980, 2001) dimensions of culture and Hall's (1966, 1976) theory of intercultural communication. These included the participants':

- Preference for face-to-face learning (one way of communication);
- Their lack of experience using online tools for learning;
- Their lack of using collaborative learning; and
- Their learning backgrounds of teacher-centred learning.

These factors could explain the limited student collaboration and interaction with the online tools. In addition, this study presented principles for the use of collaborative tools in Saudi higher education, derived from the findings. These principles will assist to improve the learning experience and support meaning-making through collaboration for Saudi students in online environments.

Based on the findings, the study recommends that the Ministry of Higher Education in Saudi Arabia continues to consider blended learning environments. Academic staff should be encouraged and supported to use online tools and collaboration for their teaching strategies. Students should be mentored into the use of online collaboration tools to support and understand group learning processes. In light of contextual factors raised, faculty members and students should be provided with equipped computer labs, adequate Internet access, and technical support services at universities. Finally, this study recommends that more studies are needed on the area of online collaborative learning in Saudi Arabia with emphasis on the cultural considerations raised in this study.

References

- Alabdulkareem, S. (2004). *Investigating science teachers' beliefs about science and teaching: Struggles in implementing science education reform in Saudi Arabia*. Doctoral dissertation, West Virginia University.
- Alanazy, S. (2011). *Saudi students' attitudes, beliefs, and preferences toward coeducational online cooperative learning*. Doctoral dissertation, Wayne State University, Detroit, Michigan.
- Alarfaj, A. (2001). *The perception of college students in Saudi Arabia towards distance web-based instruction*. Doctoral dissertation, West Virginia University.
- Alaugab, A. (2007). *Benefits, barriers, and attitudes of Saudi female faculty and students toward online learning in higher education*. Doctoral dissertation, University of Kansas.
- Aldawood, A. (1999). *Higher education in Saudi Arabia: its beginning and development*. Riyadh, Saudi Arabia.
- Alfred, L., Chia, R., Wuensch, K., & Ren, J. (2007). In-groups, out-groups and middlegroups in China and the United states. *Journal of National Social Science Association*, 29 (1).
- Al-Fulih, K. (2002). *Attributes of the internet perceived by Saudi Arabian faculty as predictors of their internet adoption for academic purposes*. Doctoral dissertation, Ohio University.
- Al-Furaih, I. S. (2002). *Internet regulations: The Saudi Arabian experience*. Riyadh, Saudi Arabia.
- Alghonaim, H. (2005). *Attitudes, barriers, and incentives of Saudi college instructors and administrators toward implementation of online instruction*. Doctoral dissertation, University of Kansas.
- Al-Habis, A. (2000). *Technology and Education*. Ministry of Higher Education. Nashrat Al-Wazarah. Retrieved 10 February, 2009, from:
http://www.mohe.gov.sa/newsletter/eddition1_old/article.html

- Al-Harthi, A. (2005). Distance higher education experiences of Arab Gulf students in the United States: A cultural perspective. *The International Review of Research in Open and Distance Learning*, 6(3), 45-62.
- Aljuwaiber, M. A. (2009). *The impact of home computers on 12 the grade students' achievement in the computer science curriculum in Riyadh, Saudi Arabia*. Doctoral dissertation, Indiana State University.
- Al-Keaid, A. A. (2004). *Choice of practice: Teaching in Saudi Arabian universities*. Doctoral dissertation, The Pennsylvania State University, University Park, PA.
- Allehaibi, M. M. (2001). *Faculty adoption of internet technology in Saudi Arabian universities*. Doctoral dissertation, Florida State University, Tallahassee, Florida.
- Allen, I. E., & Seaman, J. (2008). Staying the course: Online education in the United States, 2008. Needham MA: Sloan Consortium. Retrieved March 20, 2011 from:
http://www.sloan-c.org/publications/survey/pdf/staying_the_course.pdf.
- Almushaiqih, M. (1993). Teaching methods, instructional aids, and methods of evaluating students' achievement in Instructional Aids and Communication course. *King Saud University, College of Education*, 4(6), 15-31.
- Alshehri, A. (2005). *Assessing faculty attitudes toward the significant factors for facilitating the implementation of online courses at the Institute of Public Administration in Saudi Arabia*. Doctoral dissertation, Mississippi State University.
- Al-Wehaibi, K., Al-Wabil, A., Alshawhi, A., & Alshankity, Z. (2008). Barriers to internet adoption among faculty in Saudi Arabian universities. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2008* (pp. 24-33). Chesapeake, VA: AACE.
- Amey, M. J. (2010). Leading partnerships: Competencies for collaboration. *New Directions for Community Colleges*, 14(9), 13–23.
- Appana, S. (2008). A review of benefits and limitations of online learning in the context of the student, the instructor, and the tenured faculty. *International Journal on ELearning*, 7(1), 5-22.

- Aviv, R., Erlich, A., Ravid, G., & Geva, A. (2003). Network analysis of knowledge construction in asynchronous learning networks. *Journal of Asynchronous Learning Networks*, 7(3), 1-23.
- Barab, S. A., Thomas, M. K., & Merrill, H. (2001). Online learning: From information dissemination to fostering collaboration. *Journal of Interactive Learning Research*, 12(1), 105-143.
- Bauer, C., Chin, K. L., & Chang, V. (2000). Web-based learning: Aspects of cultural differences. In *Proceedings of the Eighth European Conference on Information Systems 2000* (pp. 1396-1402). Vienna.
- Beebe, R., Vonderwell, S., & Boboc, M. (2010). Emerging patterns in transferring assessment practices from f2f to online environments. *Electronic Journal of e-Learning*, 8(1), 1-12.
- Bennett, B., Rolheiser, C., Stevahn, L. (1991). *Co-operative learning, where heart meets mind*. Educational Connections, Ontario, Canada.
- Bennett, S. (2004). Supporting collaborative project teams using computer-based technologies. In T. S. Roberts (Ed.), *Online collaborative learning: Theory and practice* (pp. 1-27). Hershey, PA: Idea Group.
- Berg, B. L. (2001). *A dramaturgical look at interviewing, qualitative research methods for the social sciences*. Allyn & Bacon, Boston.
- Bernard, R. M., Rubalcava, B. R., & St. Pierre, D. (2000). Collaborative online distance learning: Issues for future practice and research. *Distance Education*, 21(2), 260-277.
- Bodain, Y., & Robert, J. (2003). Investigating distance learning on the internet. In *Proceedings of The 10th Annual Internet Society Conference*. Yokohama, Japan.
- Boettcher, J. V., & Conrad, R. A. (2010). *The online teaching survival guide: Simple practice and practical pedagogical tips*. San Francisco, CA: Jossey-Bass.
- Bogdan, R. C., & Biklin, S. K. (1998). *Qualitative research for education: An introduction to theory and methods*. (3rd ed.). Boston: Allyn and Bacon.

- Bradford, P., Porciello, M., Balkon, N., & Backus, D. (2007). The blackboard learning system: The be all and end all in educational instruction?. *Journal of Educational Technology Systems*, 35(3), 301-314.
- Brady, K. P., Holcomb, L. B., & Smith, B. V. (2010). The use of alternative social networking sites in higher educational settings: A case study of the e-learning benefits of learning in education. *Journal of Interactive Online Learning*, 9(2), 151-170.
- Brown, A. L. (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *The Journal of the Learning Sciences*, 2(2), 141-178.
- Brown, J. (2001). *Using surveys in language programs*. Cambridge, UK: Cambridge University Press.
- Bruffee, K. A. (1999). *Collaborative learning, higher education, independence and the authority of knowledge*. Baltimore, MD: Johns Hopkins University Press.
- Bruner, C. (1991). *Thinking collaboratively: Ten questions and answers to help policymakers improve children's service*. Washington, DC: Education and Human Services Consortium.
- Carr, W., & Kemmis, S. (1986). *Becoming critical: Education knowledge and action research*. London: Falmer Press.
- Carr-Chellman, A. (2000). The new frontier: Web-based education in U.S. culture. *Communication & Society*, 3(3), 326-336.
- Carswell, L., Thomas, P., Petre, M., Price, B., & Richards, M. (2000). Distance education via the internet: The student experience. *British Journal of Education Technology*, 31(1), 29-46.
- Carter, C. (2005). Vygotsky & assessment for learning (AfL). *Academic Research in Mathematics Teaching*, 19(2), 9-11.
- Chang, V., & Fisher, D. L. (2003). The validation and application of a new learning environment instrument for online learning in higher education. In M. S. Khine & D. L. Fisher (Eds.), *Technology-rich learning environments a future perspective* (pp. 1-20). Singapore: World Scientific Publishing.

- Chapman, E. A. (2005). *Student achievement, persistence, and perceptions in online collaborative classes*. Doctoral dissertation, University of Houston.
- Chase, M., Macfadyen, L., Reeder, K., & Roche, J. (2004). Negotiating cultures in cyberspace: Participation, patterns and problematics. *Language, Learning and Technology*, 8(3), 20-41.
- Checkland, P. (1981). *Systems thinking practice*. Chichester Wiley.
- Chen, A., Mashadi, A., & Harkrider, N. (1999). Cultural issues in the design of technology-enhanced learning systems. *British Journal of Educational Technology*, 30(3), 231-245.
- Chen, S. J., Hsu, C. L., & Caropreso, E. J. (2006). Cross-cultural collaborative online learning: When the west meets the east. *International Journal of Technology in Teaching and Learning*, 2(1), 17-35.
- Chou, C. C. (2004). A model of learner-centered computer-mediated interaction for collaborative distance learning. *International Journal on E-Learning*, 3(1), 11-18.
- Cobb, P., Confrey, J., diSessa, A., Lehrer, R., & Schauble, L. (2003). Design experiments in educational research. *Educational Researcher*, 32(1), 9-13.
- Collins, A. (1992). Towards a design science of education. In E. Scanlon & T. O'Shea (Eds.), *New directions in educational technology* (pp. 15-22). Berlin: Springer.
- Collis, B., & Moonen, J. (2001). *Flexible learning in digital world: Experiences and expectations*. London: Kogan Page.
- Communications and Information Technology Commission. (2008). Internet usage in the kingdom of Saudi Arabia individuals. *The second year (2008) report*. Retrieved 12 February, 2011, from: <http://www.citc.gov.sa/NR/rdonlyres/C48F78FB-126D-4319-A2C0-16ED8C20296B/0/CITCIndividualReport2008English.pdf>.
- Conoley, J. (2010). Why does collaboration work? Linking positive psychology and collaboration. *Journal of Educational & Psychological Consultation*, 20(1), 75-82.

- Creswell, J. W. (2003). *Research design: Quantitative, qualitative and mixed method approaches* (2nd ed.). California, Sage Publications.
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five traditions*. California, Sage Publication.
- Curtis, D. D., & Lawson, M. J. (2001). Exploring collaborative online learning. *Journal of Asynchronous Learning Networks*, 5(1), 21-34.
- Dede, C. (2005). Why design-based research is both important and difficult. *Educational Technology*, 45(1), 5-8.
- Denzin, N. K., & Lincoln, Y. S. (Eds.). (1998). *Collecting and interpreting qualitative materials*. California, Sage Publications.
- Denzin, N., & Lincoln, Y. (2000). The discipline and practice of qualitative research. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 1-28). California: Sage Publications.
- Dillenbourg, P., Baker, M., Blaye, A., & O'Malley, C. (1996). The evolution of research on collaborative learning. In P. Reinman & H. Spada (Eds.), *Learning in humans and machines: Towards an interdisciplinary learning science* (pp. 189-211). New York: Pergamon.
- Ding, X., Niu, J., & Han, Y. (2010). Research on distance education development in China. *British Journal of Educational Technology*, 41(4), 582-592.
- Driscoll, M. P. (2002). How people learn and what technology might have to do with it. *Educational Research and Improvement, ERIC Digest*. ED470032.
- Eggen, P. D., & Kauchak, D. P. (2001). *Strategies for teachers: Teaching content and thinking skills* (4th ed.). Needham Heights, MA: Allyn & Bacon.
- Elliot, J. (1991). *Action research for educational change: Developing teachers and teaching*. Great Britain: Biddles Ltd.
- Erlandson, D. Harris, E., Skipper, B., & Allen, D. (1993). *Doing naturalistic inquiry: A guide to methods*. Newbury Park, CA: Sage.
- Fetterman, D. M. (1998). *Ethnography* (2nd ed.). California, Sage Publications.

- Fischer, F., Kollar, I., Mandl, H., & Haake, J. M. (2007). Perspectives on collaboration scripts. In F. Fischer, I. Kollar, H. Mandl & J. M. Haake (Eds.), *Scripting computer-supported collaborative learning: Cognitive, computational and educational perspectives* (pp. 1-10). New York: Springer Science+Business Media, LLC.
- Foster, D., & Smith, P. (2010). Online and on target for success. *Leadership*, 39(3), 28-29.
- Fraser, B. (2001). Twenty thousand hours: Editors introduction. Learning environments research. *An International Journal*, 4(1), 2-15.
- Fraser, B., & Fisher, D. (1994). Assessing and researching the classroom environment. In D. Fisher (Ed.), *The study of learning environments* (pp. 23-39). Perth: Curtin University of Technology.
- Freeman, M. (1995). Peer assessment by groups of group work. *Assessment and Evaluation in Higher Education*, 20(3), 289-300.
- Gay, L. R. (1996). *Educational research: Competencies for analysis and application* (5th ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory*. Chicago: Aldine.
- Grabinger, R. S. (1996). Rich environments for active learning. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 665-692). New York: Simon and Schuster.
- Graham, C. R. (2005). Blended learning systems: Definition, current trends, and future directions. In C. J. Bonk & C. R. Graham (Eds.), *Handbook of blended learning: Global perspectives, local designs*. San Francisco, CA: Pfeiffer Publishing.
- Greenfield, R. (2003). Collaborative e-mail exchange for teaching secondary ESL: A case study in Hong Kong. *Language Learning and Technology*, 7(1), 46-70.
- Guba, E. G., & Lincoln, Y. S. (1989). *Fourth generation evaluation*. Newbury Park, CA: Sage.
- Gudykunst, W. (2003). *Cross cultural and intercultural communication*. Thousand Oaks, NY: Sage.

- Gunawardena, C. N., Nolla, A. C., Wilson, P. L., Lopez-Islas, R., Ramirez-Angel, N., & Megchun-Alpizar, M. (2001). A cross-cultural study of group process and development in online conferences. *Distance Education*, 22(1), 85-121.
- Gunawardena, C. N., Nolla, A., & Wilson, P. (2003). Culture and online education. In M. G. Moore & W. G. Anderson (Eds.), *Handbook of distance education* (pp. 753-775). Mahwah, NJ: Lawrence Erlbaum.
- Guzdial, M. (2003). *Computer-supported collaborative learning in support of SMET undergraduate retention: A practice-oriented CSCL research agenda*. Atlanta, GA: Georgia Tech GVU Center.
- Haefner, M. J. (2006). Ethics. In W. G. Christ (Ed.), *Assessing media education: A resource handbook for educators and administrators* (pp. 145-166). Mahwah, NJ: Lawrence Erlbaum.
- Hall, E. T. (1966). *The hidden dimension*. Garden City, NY: Doubleday.
- Hall, E. T. (1976). *Beyond culture*. Garden City, NY: Doubleday.
- Hall, E. T. (2000). Context and meaning. In L. A. Samovar & R. E. Porter (Eds.), *Intercultural Communication: A Reader* (9th ed., pp. 34-43). Belmont, CA: Wadsworth.
- Hall, M. (2008). Getting to know the feral learner. In J. Visser & M. Visser-Valfrey (Eds.), *Learners in a changing learning landscape: Reflections from a dialogue on new roles and expectations* (pp. 109-133). London: Springer.
- Hannafin, M. J., & Hill, J. (2002). Epistemology and the design of learning environments. In R. Reiser & J. Dempsey (Eds.), *Trends and issues in instructional design and technology* (pp. 70-82). New Jersey: Prentice Hall.
- Hansford, D., & Wylie, A. (2002). Description of applying an online "Jigsaw" collaborative learning strategy in an education subject. Retrieved 20 July, 2010, from:
<http://www.learningdesigns.uow.edu.au/exemplars/info/LD30/index.html>
- Hathorn, L. G., & Ingram, A. L. (2002). Cooperation and collaboration using computer-mediated communication. *Journal of Educational Computing Research*, 26(3), 247-325.

- Hathorn, L. G., & Ingram, A. L. (2002a). Online collaboration: Making it work. *Educational Technology*, 42(1), 33-40.
- Herrington, J., Reeves, T., & Oliver, R. (2005). Online learning *as information delivery: Digital myopia*. *Journal of Interactive Learning Research*, 16(4), 353-367.
- Hesse-Biber, S. N., & Leavy, P. (2006). *The practice of qualitative research*. Thousand Oaks, CA: Sage Publications.
- Hoadley, C. (2002). Creating context: Design-based research in creating and understanding CSCL. In *Proceedings of Computer Support for Collaborative Learning 2002* (pp. 1-9). Boulder, Colorado.
- Hofstede, G. & Hofstede, G. J. (2005). *Cultures and organizations: Software of the mind*. New York: McGraw-Hill.
- Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. Beverly Hills, CA: Sage.
- Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Thousand Oaks, CA: Sage.
- Holden, J. T., & Westfall, P. J. L. (2006). Instructional media selection for distance learning: A learning environment approach. *Distance Learning*, 3(2), 1-11.
- Hooker, J. (2003). *Working across cultures*. Stanford, CA.
- Hrastinski, S. (2008). Asynchronous and synchronous e-learning. *Educause Quarterly*, 31(4), 51-55.
- Huang, H. (2002). Toward constructivism for adult learners in online learning environments. *British Journal of Educational Technology*, 33(1), 27-40.
- Hui, C. H., & Triandis, H. C. (1995). Individualism-Collectivism: A study of cross-cultural researchers. *Journal of Cross-Cultural Psychology*, 17, 225-248.
- Islam and Knowledge. (1989). *Islam: A global civilization*. Washington, DC: Royal Embassy of Saudi Arabia.
- Johnson, D. W., & Johnson, R. T. (1996). Cooperation and the use of technology. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 1017-1044). New York: Simon and Schuster Macmillan.

- Johnson, D. W., & Johnson, R. T. (2004). Cooperation and the use of technology. In D. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 785-811). New York: Macmillan Library Reference.
- Johnson, D. W., Johnson, R. T., & Holubec, E. (2002). Technology-supported cooperative learning. *The Newsletter of the Cooperative Learning Institute*, 17(3).
- Jonassen, D. (2000). What are mindtools?. In D. A. Stollenwerk (Ed.), *Computers as mindtools for schools: Engaging critical thinking* (2nd ed., pp. 3-20). Upper Saddle River, NJ: Prentice-Hall.
- Jonassen, D. H. (1991). Objectivism versus constructivism: Do we need a new philosophical paradigm?. *Educational Technology Research and Development*, 39(3), 5-14.
- Jonassen, D. H., Cernusca, D., & Ionas, G. (2007). Constructivism and instructional design: The emergence of the learning science and design research. In R. A. Reiser & J. V. Dempsey (Eds.), *Trends and issues in instructional design and technology* (2nd ed., pp. 45-52). Upper Saddle River, NJ: Pearson.
- Jonassen, D., Davidson, M., Collins, M., Campbell, J., & Haag, B. B. (1995). Constructivism and computer-mediated communication in distance education. *American Journal of Distance Education*, 9(2), 7-26.
- Kellehear, A. (1993). *Simple observation, the unobtrusive researcher, a guide to methods*. Allyn & Unwin, St. Leonards, NSW.
- Kember, D., & Kwan, K. (2000). Lecturers' approaches to teaching and their relationship to conceptions of good teaching. *Instructional Science*, 2(8), 469-490.
- Keng, S. C. (2010). *Comparing the cultural dimensions and learners' perceived effectiveness of online learning system (OLS) among American and Malaysian learners*. Doctoral dissertation, Nova Southeastern University.
- King, A. (2007). Scripting collaborative learning processes: A cognitive perspective. In F. Fischer, I. Kollar, H. Mandl & J. M. Haake (Eds.), *Scripting computer-supported collaborative learning: Cognitive, computational and educational perspectives* (pp. 13-37). New York: Springer Science+Business Media, LLC.

- Ku, H., & Lohr, L. (2003). A case study of Chinese students' attitudes toward their first online learning experience. *Educational Technology Resource*, 51(3), 95-102.
- Lacro, E. (2013). *Enhancing student learning and success through the use of social networking technologies, a design-based research approach*. Doctoral dissertation, The University of Hawaii at Manoa.
- Lee, H. (2008). *Students' perceptions of peer and self assessment in a higher education online collaborative learning environment*. Doctoral dissertation, The University of Texas, Austin.
- Lee, Y., Driscoll, M., & Nelson, D. (2004). The past, present, and future of research in distance education: Results of a content analysis. *American Journal of Distance Education*, 18(4), 225-241.
- Lejk, M., Wyvill, M., & Farrow, S. (1996). A survey of methods of deriving individual grades from group assessments. *Assessment and Evaluation in Higher Education*, 2(1), 267-280.
- Lim, D., Hung, D., Wong, P., & Chun, C. (2004). The pedagogical design of ICT integration in online learning: A case study. *International Journal of Instructional Media*, 31(1), 37-48.
- Lim, G. (2003). The cultural component of global distance and online learning. In *Proceedings of World Conference on Computers in Education 2003*. Hong Kong.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. California, Sage Publications.
- Ling, P., Arger, G., Smallwood, H., Toomey, R., Kirkpatrick, D., & Barnard, I. (2001). *The effectiveness of models of flexible provision of higher education*. Canberra: Department of Education Training and Youth Affairs (DETYA).
- Lu, H., & Chiou, M. (2010). The impact of individual differences on e-learning system satisfaction: A contingency approach. *British Journal of Educational Technology*, 41, 307-323.

- MacNaughton, G., Rolfe, S. A., & Siraj-Blatchford, I. (2001). *Doing Early Childhood Research: International perspectives on theory and practice*. Australia: Allen & Unwin.
- Macrine, S. L. (2010). Barriers to inclusion of culturally and linguistically diverse students. *Peace Studies Journal*, 3(1), 76-90.
- Marshall, C., & Rossman, G. (1995). *Designing qualitative research* (2nd ed.). Newbury Park, CA: Sage.
- Masie, E. (2002). Blended learning: The magic is in the mix. In A. Rossett (Ed.), *The ASTD e-learning handbook* (pp. 5-43). New York: McGraw-Hill.
- Mason, R. (2007). Internationalizing education. In M. G. Moore (Ed.), *Handbook of distance education* (pp. 583-591). Mahwah, NJ: Lawrence Erlbaum Associates.
- Matsumoto, D. (1996). *Culture and psychology*. Pacific Grove, CA: Brooks/Cole.
- McConnell, D. (2002). Action research and distributed problem-based learning in continuing professional education. *Distance Education*, 23(1), 59-83.
- McInnerney, J. M., & Roberts, T. S. (2004). Collaborative or cooperative learning? In T. S. Roberts (Eds.), *Online collaborative learning: Theory and practice*. London, Information Science Publishing.
- McKnight, R. (2004). *Virtual necessities: Assessing online course design*. *International Journal on E-Learning*, 3(1), 5-10.
- McLaughlin, C. (2002). Computer supported teamwork: An integrative approach to evaluating cooperative learning in an online environment. *Australian Journal of Educational Technology*, 18(2), 227-254.
- McLoughlin, C. (2001). Inclusively and alignment: Principles of pedagogy, task and assessment design for effective cross-cultural online learning. *Distance Education*, 22(1), 7-29.
- Merriam, S. B. (2001). *Qualitative research and case study applications in education* (2nd ed.). Jossey-Bass Publishers.
- Mertens, D. M. (2005). *Research and evaluation in education psychology: Integrating diversity with quantitative, qualitative, and mixed methods*. California, Sage Publications.

- Mertler, C. A. (2006). *Action research: Teachers as researchers in the classroom*. California, Sage Publications.
- Mertler, C. A., & Charles, C. M. (2005). *Introduction to educational research* (5th ed.). Boston: Allyn & Bacon.
- Molenda, M., & Boling, E. (2008). Creating. In A. Januszewski, & M. Molenda (Ed.), *Educational technology: A definition with commentary* (pp. 81-140). New York, NY: Taylor & Francis Group, LLC.
- Moore, M. G., & Anderson, W. G. (2003). *A Handbook of distance education*. Mahwah NJ: Erlbaum Associates.
- Murdoch, K. (1998). *Classroom connections, strategies for integrated learning*. Eleanor Curtain, Australia.
- Myers, M. D. (1997). Qualitative research in information systems. *MIS Quarterly*, 2(21), 241-253.
- National Center for E-learning and Distance Learning. (2010). About us. Retrieved 10 February, 2010, from:
<http://www.elc.edu.sa/portal/index.php?mod=content&page=13&mylms=70701905be4e0677eb77838c644d8a1a>
- Newman, I., & Benz, C. (1998). *Qualitative-quantitative research methodology: Exploring the interactive continuum*. Carbondale, IL: Southern Illinois University Press.
- Nieto, S., & Bode, P. (2012). *Affirming diversity: The sociopolitical context of multicultural education*. Boston, MA: Pearson/Allyn & Bacon.
- Osailan, G. M. (2009). *The English literacy experiences of advanced Saudi EFL professionals in The United States*. Doctoral dissertation, Indiana University of Pennsylvania.
- Patton, M. Q. (1990). *Qualitative evaluation methods* (3rd ed.). Newbury Park, CA: Sage.
- Pedersen, S. (2004). *Designing and researching enhancements for online Learning: A commentary on Veal, Brantley, and Zulli*. *Contemporary Issues in Technology and Teacher Education*, 4(2), 163-172.

- Poole, D. M. (2000). Student participation in a discussion-oriented online course : A case study. *Journal of Research on Computing in Education*, 33(2), 162-177.
- Potter, J. (1996). *An analysis of thinking and research about qualitative methods*. Mahwa, NJ: Lawrence Erlbaum Associates.
- Pratt, D. D. (2002). Good teaching: One size fits all?. In J. M. Ross-Gordon (Ed.), *Contemporary viewpoints on teaching adults effectively* (pp. 5- 16). San Francisco, CL: Joosy-Bass.
- Rafiq, Y., & Fullerton, H. (1996). Peer assessment of group projects in civil engineering. *Assessment and Evaluation in Higher Education*, 21(1), 69-81.
- Reeves, T. C. (2000). Socially responsible educational research. *Educational Technology*, 40(6), 19-28.
- Reeves, T. C. (2006). Design research from a technology perspective. In J. van den Akker, K. Gravemeijer, S. McKenney & N. Nieveen (Eds.), *Educational design research* (pp. 52-66). London: Routledge.
- Reiser, R. A. (2001). A history of instructional design and technology: Part II: A history of instructional design. *Educational Technology Research and Development*, 49(2), 57-67.
- Reisetter, M., & Boris, G. (2004). What works: Student perceptions of effective elements in online learning. *Quarterly Review of Distance Education Greenwich*, 5(4), 227-293.
- Resta, P. (2007). Technology in support of collaborative learning. *Educational Psychology Review*, 1(9), 65-83.
- Resta, P., Awalt, C., & Menchaca, M. (2002). Self and peer assessment in an online collaborative learning environment. In *Proceedings of World Conference on ELearning in Corporate, Government, Healthcare, and Higher Education 2002* (pp. 682-689). Norfolk, VA: AACE.
- Roberts, T. (2005). Computer-supported collaborative learning in higher education. *Information Management*, 18(1/2), 11-12.
- Roberts, T. S. (2004). *Online collaborative learning: Theory and practice*. Central Queensland University, Australia.

- Robinson, B. (1999). Asian learners, western models: Some discontinuities and issues for distance educators. In R. Carr, O. J. Jegede, W. Tat-men & Y. Kinsun (Eds.), *The Asian distance learner* (pp. 33-48). Hong Kong: Open University of Hong Kong.
- Roschelle, J., & Teasley, S. (1995). The construction of shared knowledge in collaborative problem-solving. In C. E. O'Malley (Ed.), *Computer supported collaborative learning* (pp. 69-97). Heidelberg: Springer-Verlag.
- Rose, H. (1991). Case studies. In G. Allan, & C. Skinner (Eds.), *Handbook for research students in the social sciences* (pp. 190-202). Falmer Press.
- Rose, M. A. (2002). *Cognitive dialogue, interaction patterns, and perceptions of graduate students in an online conferencing environment under collaborative and cooperative structures*. Unpublished doctoral dissertation, Indiana University, Bloomington.
- Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (2001). Methodological issues in the content analysis of computer conference transcripts. *International Journal of Artificial Intelligence in Education*, 12(1), 8-22.
- Rovai, A. P. (2004). A constructivist approach to online college learning. *The Internet and Higher Education*, 7(2), 79-93.
- Rubin, L. (2002). "I just think maybe you could. . ." Peer critiquing through online conversations. *Teaching English in the Two-Year College*, 2(9), 382-392.
- Saba, F., & Shearer, R. (1994). Verifying theoretical concepts in a dynamic model of distance education. *American Journal of Distance Education*, 8(1), 36-59.
- Safran, C., Helic, D. & Guetl, C. (2007). E-learning practices and Web 2.0. In *Proceedings of the International Computers in Learning Conference 2007* (pp. 1-8). Vilach, Austria.
- Saleh, S. J. (1998). *Lights on the Family System in Islam*. Jeddah, Saudi Arabia.
- Sandoval, W. A. (2004). Developing learning theory by refining conjectures embodied in educational designs. *Educational Psychologist*, 39(4), 213-223.
- Savery, J. R., & Duffy, T. M. (1995). Problem-based learning: An instructional model and its constructivist framework. *Educational Technology*, 35(5), 31-38.

- Scardamalia, M., & Bereiter, C. (2006). Knowledge building: Theory, pedagogy, and technology. In R. K. Sawyer (Ed.), *Cambridge handbook of the learning sciences* (pp. 97-118). New York: Cambridge University Press.
- Sheu, Y. S. (2005). *International students' perceptions towards online learning in American higher education*. Unpublished doctoral dissertation, University of South Dakota, Mankato.
- Shunk, D. H. (2000). *Learning theories: An educational perspective* (3rd ed.). Upper Saddle River, NJ: Prentice-Hall.
- Simonson, M., Smaldino, S., Albright, M., & Zvacek, S. (2009). *Teaching and learning at a distance: Foundations of distance education*. Boston, MA: Allen and Bacon.
- Singh, O. (2009). *Development and validation of a web-based module to teach metacognitive learning strategies to students in higher education*. Doctoral dissertation, University of South Florida.
- Stacey, E. (1999). Collaborative learning in an online environment. *Journal of Distance Education*, 14(2), 14-33.
- Stahl, G. (2006). *Group cognition: Computer support for building collaborative knowledge*. The MIT Press.
- Stringer, E. (2004). *Action research in education*. Upper Saddle River NJ: Pearson Education Inc.
- Swenson, P., & Redmond, P. (2009). Online, hybrid, and blended coursework and the practice of technology-integrated teaching and learning within teacher education. *Issues in Teacher Education*, 18(2), 3-10.
- Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology*. Thousand Oaks, CA: Sage.
- Teddlie, C., & Tashakkori, A. (Eds.). (2002). *Handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage.
- Tham, C. M., & Werner, J. M. (2002). Designing and evaluating e-learning in higher education: A Review and literature. *E-Learning and Higher Education*, 1-17.
- The Design-Based Research Collective (2003). Design-based research: An emerging paradigm for educational enquiry. *Educational Researcher*, 32(1), 5-8.

- The General Directory of Educational Planning. (2003). Ministry of Education plan for the next ten years 2003–2013. [Brochure]. Riyadh, Saudi Arabia: Ministry of Education.
- Thurmond, V.A., & Wamback, K. (2004). Understanding interactions in distance education: A review of the literature. *International Journal of Instructional Technology and Distance Learning*, 1(1). Retrieved 11 August, 2011, from: http://www.itdl.org/journal/Jan_04/article02.htm
- Tozer, J. (1997). *Leading initiatives*. Chatswood, Australia: Butterworth Heinemann.
- Tsai, C. C., Lin, S. S. J., & Yuan, S. M. (2002). Developing science activities through a networked peer assessment system. *Computers and Education*, 3(8), 241-252.
- Tu, C., & Corry, M. (2003). Designs, managements, and strategies in asynchronous learning discussions. *Quarterly Review of Distance Education*, 4(3), 303-315.
- Turner, T. (2011). Power in collaboration. *Harvard International Review*, 33(1), 74–77.
- Tylor, E. (1871). *Primitive culture*. New York: J. P. Putnam's Sons.
- Uribe, D., Klein, J. D., & Sullivan, H. S. (2003). The effects of computer-mediated collaborative learning on solving ill-defined problems. *Educational Technology, Research, and Development*, 51(1), 5-19.
- Valacich, J. S., Paranka, D., George, J. F., & Nunamaker, J. F. (1993). Communication concurrency and the new media: A new dimension for media richness. *Communication Research*, 20(2), 249-276.
- van den Akker, J. (1999). Principles and methods of development research. In J. van den Akker, N. Nieveen, R. M. Branch, K. L. Gustafson & T. Plomp (Eds.), *Design methodology and developmental research in education and training* (pp. 1-14). The Netherlands: Kluwer Academic Publishers.
- Visser, Y. L. (2008). Postsecondary education in the changing learning and living landscapes. In J. Visser & M. Visser-Valfrey (Eds.), *Learners in a changing learning landscape: Reflections from a dialogue on new roles and expectations* (pp. 135-163). London: Springer.
- Vygotsky, L. S. (1962). *Thought and language*. Cambridge, MA: MIT Press.

- Vygotsky, L. S. (1978). *Mind in Society: The development of higher psychological Processes*. Cambridge, (Mass.): Harvard University Press.
- Wang, F., & Hannafin, M. (2003). Importance of design-based research for technology-enhanced learning environments. In G. Richards (Ed.). In *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2003* (pp. 1813-1816). Chesapeake, VA: AACE.
- Wang, F., & Hannafin, M. J. (2005). Design-based research and technology – enhanced learning environments. *Educational Technology Research and Development*, 53(4), 5-23.
- Weinberger, A. (2003). *Scripts for computer-supported collaborative learning: Effects of social and epistemic cooperation scripts on collaborative knowledge construction*. Ludwig-Maximilians-Universität, München.
- Wen, M. L., & Tsai, C. (2006). University students' perceptions of and attitudes toward (online) peer assessment. *Higher Education*, 51(1), 27-44.
- Wenger, E. (1998). *Community of practice: Learning, meaning and identity*. New York: Cambridge University Press.
- Westbrook, V. (2006). The virtual learning future. *Teaching in Higher Education*, 11(4), 471-482.
- Willems, J. (2005). Flexible learning: Implications of "when-ever", "where-ever" and "what-ever". *Distance Education*, 26, 429-435.
- Wurtz, E. (2005). A cross-cultural analysis of websites from high-context cultures and low-context cultures. Retrieved 15 September, 2012 from: <http://jcmc.indiana.edu/vol11/issue1/>.
- Xiong, Q. L. (2009). *A case study of online collaboration among Chinese international students in US universities*. Doctoral dissertation, Northern Illinois University, DeKalb.
- Yin, R. (1989). *Case study research: Design and methods*. California, Sage Publications.

Yoder, M. (2007). Electronic constructivism in online learning: Practical guidelines and replicable examples. In C. Crawford, D. A. Willis, R. Carlsen, I. Gibson, K. McFerrin, J. Price & R. Weber (Eds.), In *Proceedings of Society for Information Technology and Teacher Education International Conference 2007* (pp. 574-578). San Antonio Texas, USA: AACE.

Appendix 1: Information sheet (example)

University of Wollongong



Information sheet for students

TITLE: *Collaborative Blended Learning with Higher Education Students in an Arabic Context.*

PURPOSE OF THE RESEARCH

The purpose of this study is to investigate student collaboration in Saudi higher education through the use of online collaborative tools that compliment the face-to-face experiences offered. This study aims to examine how these tools may support student learning through group tasks orchestrated and completed within an online learning environment. Throughout the two iterations of this study, particular attention is paid to contextual and cultural factors that could potentially support or hinder student learning in the blended learning environment.

RESEARCHER

Omar Al-Ismaiel
Faculty of Education
Oaai980@uow.edu.au

METHOD AND DEMANDS ON PARTICIPANTS

If you choose to enrol in the course "*Producing and Using Instructional Tools*", we will seek your participation in the activities and assignments provided for the course which is to be researched. This research will involve 3 x 20 minute interviews, conducted before, during and after the course (one hour of your time) that will be audio recorded to ascertain the factors that have supported or inhibited your use of the Blackboard learning management system. Interviews will be based around a number of predetermined categories which include "your social and cultural background, your beliefs regarding technology, the difficulties that you have confronted within your use of technology, the personal factors that affect the use of technology and the type of modules or tools you prefer to use during the implementation of the Blackboard course". I also request your permission to observe "your personal reflections on your own journal and your social interaction in the classroom as well as on the Blackboard system".

POSSIBLE RISKS, INCONVENIENCES AND DISCOMFORTS

Apart from the 1 hour of your time for the interviews and observing your work during the course, I can foresee no risks for you. Your involvement in the study is voluntary and you may withdraw your participation from the study at any time and withdraw any data that you have provided to that point. Refusal to participate in the study will not affect your relationship with the class teacher. To withdraw from the study, please inform the Research Assistant/colleague who is conducting the interviews. Access to your interviews will only be granted to the researcher after your grades are declared.

ETHICS REVIEW AND COMPLAINTS

This study has been reviewed by the Human Research Ethics Committee (Social Science, Humanities and Behavioural Science) of the University of Wollongong. If you have any concerns or complaints regarding the way this research has been conducted, you can contact the UOW Ethics Officer on (02) 4221 4457.

Thank you for your interest in this study.

Appendix 2: Consent form (example)

University of Wollongong



Consent Form for University Students

Collaborative Blended Learning with Higher Education Students in an Arabic Context

Researcher: Omar Al-Ismaiel

I have been given information about “*Collaborative Blended Learning with Higher Education Students in an Arabic Context*”. I have discussed this research project with Omar Al-Ismaiel, the subject teacher of Producing and Using Instructional Tools offered by King Faisal University. This is part of a PhD degree supervised by Dr Lisa Kervin & Dr Sarah Howard from the Faculty of Education at the University of Wollongong.

I understand that if I consent to participate in this project I will be asked to allow copies of my print and electronic communications in Producing and Using Instructional Tools subject, including my reflective journal and forum contributions to be used in the study. I also consent to participate in an interview to be conducted by a Research Assistant before, during and after the academic session has concluded. I understand that my contribution will be confidential and that there will be no personal identification in the data that I agree to allow to be used in the study. I understand that there are no potential risks or burdens associated with this study.

I have agreed to provide an electronic copy of my reflective journal and personal comments for retention for the purposes of the study, which will be stripped of personal identifiers and coded by the research assistant prior to any analysis. I have had an opportunity to ask Omar Al-Ismaiel any questions I may have about the research and my participation. I understand that my participation in this research is voluntary and I am free to refuse to participate and I am free to withdraw from the research at any time. My refusal to participate or withdrawal of consent will not affect my relationship with the Faculty of Education at the King Faisal University in my course/program of study.

If I have any enquires about the research, I can contact Omar Al-Ismaiel and/or Dr Lisa Kervin & Dr Sarah Howard. If I have any concerns or

complaints regarding the way the research is or has been conducted, I can contact the Ethics Officer, Human Research Ethics Committee, University of Wollongong on 42214457.

By signing below I am indicating my consent to participate in the research. I understand that the data collected from my participation will be used primarily for a PhD thesis, and will also be used in summary form for journal publication, and I consent for it to be used in that manner.

Signed

.....

Name (please print)

.....

Date

...../...../.....

Appendix 3: Collaborative tasks

Task 1: Create a website about using technology in Education.

Due date: Part A: Week 6

Part B: Week 8

Weighting: Part A: 15%

Part B: 15%

Format and length: Word-processed document of approximately 500 words plus website using FrontPage software or any other similar platforms.

Group assignment details:

Groups should consist of 3 members.

Groups need to be identified to lecturer in week 2.

Part A:

You need to discuss your topic and design with your group members via Blackboard tools provided (discussion forum, chat tool and email), and write your plan in approximately 500 words.

Part B:

Investigate the use of technology in Education and prepare your design through your discussion with classmates via class discussions as well as Blackboard tools:

- Examine the effectiveness of using technology in Education.
- Examine and learn to use a software program or web application (from a suggested software provided in class or from your own choice).
- Select an appropriate format for your own design.
- Discuss different examples and topics of the effectiveness of using technology in Education.

Assessment criteria:

- Appropriate choice of format for your design presentation.
- Definition and discussion of different topics on using technology in Education and your collaboration with your group members and with other groups.
- Appropriate examples of the effectiveness of using technology in Education.
- Clarity of expression and general presentation. (This includes relevant texts and images and necessary links and icons).
- Evidence of development of ideas in online interactions. (This includes interacting with information and ideas, questioning implications of ideas, posing hypotheses or challenge questions about ideas and building on ideas through responses).

Task 2: Podcast or video narrative.

Students are to select either option 1 or option 2 for completion of this task.

Option 1: Create a podcast about using synchronous/ asynchronous tools in Education.

Due date: Part A: Week 11

Part B: Week 13

Weighting: Part A: 15%

Part B: 15%

Format: Audio file.

Group assignment details:

Groups should consist of 3 members.

Part A:

- You need to identify and discuss the topic with your peers, and write your plan using discussion forum tool in approximately 500 words.
- You will need to prepare your plan for the design of the task with your peers.
- All details of the assignment will be discussed in the class as well as via Blackboard tools.

Part B:

- Satisfactory design of the product.
- Students are required to design and submit their product on Bb system.
- Each product should include:
 - 1- Appropriate design.
 - 2- Proper content and sufficient details.
 - 3- Sufficient time (2 -5 min).

Assessment criteria:

- Definition and discussion of the topic and your collaboration with your peers.
- Satisfactory presentation of the product. (This includes relevant information in sufficient details and sufficient time).
- Appropriate design and development of the task.
- Clarity of expression and general presentation.
- Evidence of development of ideas in online interactions. (This includes interacting with information and ideas, questioning implications of ideas, posing hypotheses or challenge questions about ideas and building on ideas through responses).

Option 2: Create a digital narrative about using mobile phones in Education.

Due date: Part A: Week 11

Part B: Week 13

Weighting: Part A: 15%

Part B: 15%

Format: Video file.

Group assignment details:

Groups should consist of 3 members.

You are to produce a digital video narrative about using mobile phone in Education and submit the product to the lecturer via submission tool on Bb system.

Part A:

- You need to identify and discuss the topic with your peers, and write your plan for the design of the product using discussion forum tool in approximately 500 words.
- Discussion, design and development of the product will be assessed through class discussion as well as Blackboard tools such as chat tool, discussion forum and email.

Part B:

- Satisfactory design of the product.
- Students are required to design and submit their product on Bb system.
- Each product should include:
 - 1- Appropriate design.
 - 2- Proper content and sufficient details.
 - 3- Sufficient time (2 -5 min).

Assessment criteria:

- Definition and discussion of the topic into each collaborative group.
- Satisfactory presentation of the product. (This includes relevant information in sufficient details and sufficient time).
- Appropriate design and development of the product.
- Clarity of expression and general presentation.
- Evidence of development of ideas in online interactions. (This includes interacting with information and ideas, questioning implications of ideas, posing hypotheses or challenge questions about ideas and building on ideas through responses).

Appendix 4: Audit Trail for the two iterations

Audit Trail (Iteration 1)

Date	Data Collected	Assigned Code
12/3/10	Online observation checklist	OC12.3
17/3/10		OC17.3
26/3/10		OC26.3
2/4/10		OC2.4
9/4/10		OC9.4
16/4/10		OC16.4
23/4/10		OC23.4
30/4/10		OC30.4
7/5/10		OC7.5
14/5/10		OC14.5
21/5/10		OC21.5
28/5/10		OC28.5
4/6/10		OC4.6
12/3/10	F2F observation checklist	FC12.3
17/3/10		FC17.3
26/3/10		FC26.3
2/4/10		FC2.4
9/4/10		FC9.4
16/4/10		FC16.4
23/4/10		FC23.4
30/4/10		FC30.4
7/5/10		FC7.5
14/5/10		FC14.5
21/5/10		FC21.5
28/5/10		FC28.5
4/6/10		FC4.6
16/4/10	Researcher's observation journal	RJ16.4
4/6/10		RJ4.6
12/3/10	Discussion forum transcripts	DT12.3
17/3/10		DT17.3
26/3/10		DT26.3
2/4/10		DT2.4
9/4/10		DT9.4
16/4/10		DT16.4
23/4/10		DT23.4
30/4/10		DT30.4

7/5/10		DT7.5
14/5/10		DT14.5
21/5/10		DT21.5
28/5/10		DT28.5
4/6/10		DT4.6
12/3/10	Chat tool transcripts	CT12.3
17/3/10		CT17.3
26/3/10		CT26.3
2/4/10		CT2.4
9/4/10		CT9.4
16/4/10		CT16.4
23/4/10		CT23.4
30/4/10		CT30.4
7/5/10		CT7.5
14/5/10		CT14.5
21/5/10		CT21.5
28/5/10		CT28.5
4/6/10		CT4.6
12/3/10	Journal tool transcripts	JT12.3
17/3/10		JT17.3
26/3/10		JT26.3
2/4/10		JT2.4
9/4/10		JT9.4
16/4/10		JT16.4
23/4/10		JT23.4
30/4/10		JT30.4
7/5/10		JT7.5
14/5/10		JT14.5
21/5/10		JT21.5
28/5/10		JT28.5
4/6/10		JT4.6
12/3/10	Email tool transcripts	ET12.3
17/3/10		ET17.3
26/3/10		ET26.3
2/4/10		ET2.4
9/4/10		ET9.4
16/4/10		ET16.4
23/4/10		ET23.4
30/4/10		ET30.4
7/5/10		ET7.5
14/5/10		ET14.5
21/5/10		ET21.5

28/5/10		ET28.5
4/6/10		ET4.6
6/3/10	Semi-structured preliminary interview	SPI6.3
10/4/10	Semi-structured intervening interview	SII10.4
29/5/10	Semi-structured post interview	SPOI29.5
12/3/10	Collaborative task (1) part (A)	CT1A12.3
17/3/10		CT1A17.3
26/3/10		CT1A26.3
2/4/10		CT1A2.4
9/4/10		CT1A9.4
9/4/10	Collaborative task (1) part (B)	CT1B9.4
16/4/10		CT1B16.4
16/4/10	Collaborative task (2) part (A)	CT2A16.4
30/4/10		CT2A30.4
7/5/10		CT2A7.5
7/5/10	Collaborative task (2) part (B)	CT2B7.5
14/5/10		CT2B14.5
21/5/10		CT2B21.5

Audit Trail (Iteration 2)

Date	Data Collected	Assigned Code
1/10/10	Online observation checklist	OC1.10
8/10/10		OC8.10
15/10/10		OC15.10
22/10/10		OC22.10
29/10/10		OC29.10
5/11/10		OC5.11
12/11/10		OC12.11
19/11/10		OC19.11
26/11/10		OC26.11
3/12/10		OC3.12
10/12/10		OC10.12
17/12/10		OC17.12
24/12/10		OC24.12
31/12/10		OC31.12
7/1/11		OC7.1
1/10/10	F2F observation checklist	FC1.10
8/10/10		FC8.10
15/10/10		FC15.10
22/10/10		FC22.10
29/10/10		FC29.10
5/11/10		FC5.11
12/11/10		FC12.11
19/11/10		FC19.11
26/11/10		FC26.11
3/12/10		FC3.12
10/12/10		FC10.12
17/12/10		FC17.12
24/12/10		FC24.12
31/12/10		FC31.12
7/1/11		FC7.1
12/11/10	Researcher's observation journal	RJ12.11
7/1/11		RJ7.1
1/10/10	Discussion forum transcripts	DT1.10
8/10/10		DT8.10
15/10/10		DT15.10
22/10/10		DT22.10
29/10/10		DT29.10
5/11/10		DT5.11
12/11/10		DT12.11

19/11/10		DT19.11
26/11/10		DT26.11
3/12/10		DT3.12
10/12/10		DT10.12
17/12/10		DT17.12
24/12/10		DT24.12
31/12/10		DT31.12
7/1/11		DT7.1
1/10/10	Chat tool transcripts	CT1.10
8/10/10		CT8.10
15/10/10		CT15.10
22/10/10		CT22.10
29/10/10		CT29.10
5/11/10		CT5.11
12/11/10		CT12.11
19/11/10		CT19.11
26/11/10		CT26.11
3/12/10		CT3.12
10/12/10		CT10.12
17/12/10		CT17.12
24/12/10		CT24.12
31/12/10		CT31.12
7/1/11		CT7.1
1/10/10	Journal tool transcripts	JT1.10
8/10/10		JT8.10
15/10/10		JT15.10
22/10/10		JT22.10
29/10/10		JT29.10
5/11/10		JT5.11
12/11/10		JT12.11
19/11/10		JT19.11
26/11/10		JT26.11
3/12/10		JT3.12
10/12/10		JT10.12
17/12/10		JT17.12
24/12/10		JT24.12
31/12/10		JT31.12
7/1/11		JT7.1
1/10/10	Email tool transcripts	ET1.10
8/10/10		ET8.10
15/10/10		ET15.10
22/10/10		ET22.10

29/10/10		ET29.10
5/11/10		ET5.11
12/11/10		ET12.11
19/11/10		ET19.11
26/11/10		ET26.11
3/12/10		ET3.12
10/12/10		ET10.12
17/12/10		ET17.12
24/12/10		ET24.12
31/12/10		ET31.12
7/1/11		ET7.1
4/10/10	Semi-structured preliminary interview	SPI4.10
29/11/10	Semi-structured intervening interview	SII29.11
3/1/11	Semi-structured post interview	SPOI3.1
15/10/10	Collaborative task (1) part (A)	CT1A15.10
22/10/10		CT1A22.10
29/10/10		CT1A29.10
5/11/10		CT1A5.11
12/11/10		CT1A12.11
12/11/10	Collaborative task (1) part (B)	CT1B12.11
19/11/10		CT1B19.11
3/12/10	Collaborative task (2) part (A)	CT2A3.12
10/12/10		CT2A10.12
17/12/10		CT2A17.12
24/12/10		CT2A24.12
17/12/10	Collaborative task (2) part (B)	CT2B17.12
24/12/10		CT2B24.12

Appendix 5: Subject aims, learning outcomes, and details

Subject Name: Producing and Using Instructional Tools.

Sector: Undergraduate students.

After graduation, they will teach in secondary and university sectors.

Level: 1st year.

Outline

The major purpose of this subject is to identify and classify different types of instructional tools, identifies how to use these tools and find the significant relationship between the instructional tools and elements of educational communication. In addition, this subject allows learners to understand the norms and basic knowledge in producing different types of instructional tools based on the nature of the educational context including traditional tools such as Blackboard or Whiteboard as well as Web-based instructional tools such as Computer and HTML tools.

General Aims of the Subject

The general aims of the subject are to:

1. Identify the different types of instructional tools, their significance, their classifications, the factors of their selection and how to use them appropriately.
2. Identify basic skills in designing and producing the different types of instructional tools.
3. Identify the appropriateness of the scientific affordances of using instructional tools based on the nature of diverse educational settings.
4. Encourage learners to adopt these instructional tools through their learning environment.
5. Identify meaningful skills of educational communication.
6. Reinforce these instructional tools based on new technology.

Learning Outcomes

After studying this subject, the learners will be able to:

1. Identify the main concepts and facts which are related to the instructional tools.
2. Select an appropriate instructional tool that is relevant to a particular learning context.
3. Use different types of instructional tools properly based on scientific norms.
4. Characterise diverse types of instructional tools properly.
5. Connect a variety of instructional tools to a new technology.
6. Recognise the elements of educational communication in different educational contexts.
7. Produce numerous types of instructional tools.
8. Design and produce new instructional tools that are related to technology and based on a particular educational context.

Subject Details

Study Time

Students who are enrolled in this subject should attend 2 hours face-to-face class time per week in keeping with policy of King Faisal University (KFU).

Duration	Activities	Doing interviews
1 – hour	Lecture + face-to-face class discussion.	
20 – minutes	Reading – study.	
20 – minutes	Using Blackboard system.	
20 – minutes	Doing assignments.	
Total: 2 hours		

Outside of class time:

- Computer lab will be booked for students for 1 hour out of class time per week during the session.
- Students can contact the teacher during office hours and out of class time. Otherwise, emails could be sent for any questions during the session.

Lecture Schedule

Week	Topics
1	Orientation and how to use Blackboard.
2	Orientation and how to use Blackboard.
3	<ul style="list-style-type: none"> - Why do we use instructional tools? - Classification of instructional tools. - What are instructional tools?
4	What are the different types of instructional tools? 1- Visual aids. 2- Audio. 3- Audio-visual.
5	Norms of instructional tools selection: 1- Validity of the content. 2- Appropriateness for the students' characteristics.
6	<ul style="list-style-type: none"> - Norms- continued: 3- Appropriateness for the teaching strategy. 4- Contribution to the achievement of teaching objectives.
7	<ul style="list-style-type: none"> - How to select an appropriate instructional tool? 1- Understand the subject goals and activities. 2- Specify the required instructional tool.
8	<ul style="list-style-type: none"> - How to produce an appropriate design? 1- Consistency and normality. 2- Repetition and consistency. 3- Contrast.
9	Public Holiday.
10	- Focus on definition and identity: What is educational communication?
11	<ul style="list-style-type: none"> - What is ICT in Education? 1- Definition. 2- The role of technology in teaching and learning. 3- Advantages of technology in Education.
12	- The relationship between ICT in Education and learning skills.
13	<ul style="list-style-type: none"> - Discuss examples of technology tools used in educational context. 1- Email. 2- Chat.
14	<ul style="list-style-type: none"> - Examples of technology tools- continued: 3- Discussion forum. 4- Mobile learning. 5- Social software.
15	<ul style="list-style-type: none"> - Planning to produce and design technology tools: 1- Analysis stage. 2- Strategy stage. 3- Evaluation stage.

Student evaluation

Student evaluation of subject will be obtained from students through interviews as well as their personal reflections from journal tool on Blackboard system.

Assessment

1. Minimum attendance and performance requirements

- All requirements related to attendance and performance will be assessed based on the policy of KFU.
- All students should perform minimum requirements of activities provided on each tool of Bb system.
- **Location of lectures:** Computer lab.

2. Summary

Task (All tasks are group tasks)	Length (min)	Weighting	Due date
Task 1: Create a website.	Part A: 1. Your discussion of the topic with your group members via Blackboard tools (5 postings in minimum).	5%	Week 6
	- Length of postings- (100 words). 2. Written plan (500 words).	10%	Week 6
	Part B: Appropriate choice of examples and design.	15%	Week 8
Task 2: Podcast or video narrative.	Student to choose either option 1 or 2. <u>Option 1:</u> Part A: 1. Your discussion of the topic with your group members via Blackboard tools (5 postings in minimum).	5%	Week 11
	- Length of postings (100 words). 2. Written plan using discussion forum tool (500 words).	10%	Week 11
	Part B: Satisfactory design of the product.	15%	Week 13

	<ul style="list-style-type: none"> - Students are required to design and submit their product on Bb system. - Each product should include: <ol style="list-style-type: none"> 1- Appropriate design. 2- Proper content and sufficient details. 3- Sufficient time (2 -5 min). 		
	<u>Option 2:</u> Part A: 1. Your discussion of the topic with your peers via Blackboard tools (5 postings in minimum). - Length of postings (100 words).	5%	Week 11
	2. Written plan using discussion forum tool (500 words).	10%	Week 11
	Part B: Satisfactory design of the product. - Students are required to design and submit their product on Bb system. - Each product should include: <ol style="list-style-type: none"> 1- Appropriate design. 2- Proper content and sufficient details. 3- Sufficient time (2 -5 min). 	15%	Week 13

3. Requirements related to student contributions

All group members will obtain the same mark for the tasks. However, the teacher reserves the right to assign individual marks for students for the assessment if necessary.

4. Submission Rules

According to the KFU policy, all tasks should be submitted on due dates, otherwise marks will be deducted for late submission.

Appendix 6: Group E's analysis of collaborative tasks (task transcripts)

Iteration 2

Task (1): This task required students to plan and discuss diverse topics with peers to create a website about the use of technology in Education. The student participants were required to design a proper website (including texts, images, links..etc) that shows the group's topics, demonstrates expression and general presentation, and develops the ideas raised in the discussion forum.

Tool: Discussion forum.

The student participants were required to use this tool to collaborate with their group members and to discuss the task. Each group member was required to participate in five responses in minimum and each response had to consist of at least 100 words in order to finalise the task. The online group discussion was transcribed and coded as follows:

Group: E

Week	Student	Task contribution	Code
3	Adham	No participation.	
3	Asem		
3	Talal		
4	Adham	No participation.	
4	Asem		
4	Talal		
5	Asem	"We should know what technology in Education means. We need to define the term of technology in Education and how this can be used. I think this will be a good way for us to start with the definition which leads us to the related topics" (CT1A29.10), (Post 1).	- Task definition.
5	Adham	"I agree with Asem to define the term of technology in Education and how it can be	- Confirmation "Agreement".

		<p>used" (CT1A29.10), (Post 2).</p> <p>"The term of technology in Education has a wide meaning. This term could include the tools that are used in the classroom by the teacher. It also could include the teaching methods that are implemented or it could involve the way of communication between the teacher and students" (CT1A29.10), (Post 3).</p> <p>"We should also know what the rationale for using technology in Education is" (CT1A29.10), (Post 4).</p> <p>"I suggest to include this topic because this will assist us to identify the use of technology in Education and then link it to other topics such as the advantages and disadvantages of using technology and the examples of technological tools" (CT1A29.10), (Post 5).</p>	<p>- Task process.</p> <p>- Suggestion "process development".</p> <p>- Task process.</p>
5	Asem	<p>"I agree with Adham to stress on the rationale for using technology in Education" (CT1A29.10), (Post 6).</p> <p>"I think it is important to include the advantages and disadvantages of using technology in Education. This topic will give us an opportunity to examine a variety of experiences for both teachers and students which is very significant in the learning process" (CT1A29.10), (Post 7).</p>	<p>- Confirmation "Agreement".</p> <p>- Suggestion "process development".</p>
5	Adham	"I suggest to include some challenges of using technology in Education" (CT1A29.10), (Post 8).	- Suggestion "process development".
5	Asem	"The use of technology in Education enhances the all elements of the learning process including teachers, students, teaching methods, the subject, the learning materials and the learning environment" (CT1A29.10), (Post 9).	- Task process.
5	Adham	"I suggest to include different examples of technology tools in Education" (CT1A29.10), (Post 10).	- Suggestion "process development".

		"The inclusion of different examples of technological tools such as visual or audio tools in our work is useful to clarify in which way the technology can be applied to improve students' skills in the learning environment" (CT1A29.10), (Post 11).	- Task process.
5	Asem	"Desktop computers, laptops, mobile learning, social network tools....etc are significant for both teachers and students" (CT1A29.10), (Post 12).	- Task process.
5	Talal	No participation.	
6	Talal	"I agree with you guys to include the rationale for using technology in Education, the advantages and disadvantages of using technology in Education for both teachers and students" (CT1A5.11), (Post 13).	- Confirmation "Agreement".
		"I suggest to include one example of using technological tool in Education such as a visual tool instead of different examples" (CT1A5.11), (Post 14).	- Suggestion "process development".
6	Adham	No participation.	
6	Asem		
7	Adham	No participation.	
7	Asem		
7	Talal		

Task (2): This task required students to create a podcast about the use of synchronous/asynchronous tools in Education or video narrative about using mobile phones in Education. The student participants were required to design an appropriate audio or video file that shows the group's product, clarifies expression and general presentation, and develops the ideas discussed in the discussion forum.

Tool: Discussion forum.

Each group member was required to use this tool to collaborate with peers in five participations in minimum and each participation had to consist of at least 100 words

in order to complete the task. The online group discussion was transcribed and coded as follows:

Group: E

Week	Student	Task contribution	Code
8	Adham	No participation.	
8	Asem		
8	Talal		
9	Adham	No participation.	
9	Asem		
9	Talal		
10	Adham	"I think it is a good option for us if we worked on asynchronous tool such as discussion forum. It can be utilised as an effective tool in the learning context. This tool can be implemented for numerous functions such as communication and education. The teacher may use it for educational communication and information transfer. In addition, this tool has an important feature where the teacher's and students' threads can be saved for long time" (CT2A3.12). (Post 1).	- Task process.
10	Talal	<p>"I agree with Adham to select discussion forum as a topic of our discussion for the final task" (CT2A3.12). (Post 2).</p> <p>"Discussion forum can be used in Education as learning tool for educational purposes such as communication with students about the subject" (CT2A3.12). (Post 3).</p> <p>"I suggest to focus our discussion on particularly Education field as discussion forum is used for general communication" (CT2A3.12). (Post 4).</p>	<p>- Confirmation "Agreement".</p> <p>- Task process.</p> <p>- Suggestion "process development".</p>
10	Asem	<p>"I agree with you guys to focus on the use of discussion forum in Education" (CT2A3.12). (Post 5).</p> <p>"Every learning tool should have advantages and disadvantages in the learning context. These two aspects can support or hinder the teacher or students performances or both of them in the learning process. I suggest to include this topic because it associates with our discussion. Following this, we can exhibit the</p>	<p>- Confirmation "Agreement".</p> <p>- Suggestion "process development".</p>

		significance of discussion forum as learning tool" (CT2A3.12). (Post 6).	
10	Adham	"I suggest to explain the importance of using discussion forum, particularly in Education field as Talal suggested. I mean this tool can be used for general communication in public. However, it also is important to be used for educational communication" (CT2A3.12). (Post 7).	- Suggestion "process development".
10	Talal	"I agree with Adham to focus on the importance of using discussion forum in Education" (CT2A3.12). (Post 8). "The rationale for the use of discussion forum is an important topic to be included in our final product. We need to think carefully about this question: Why do we use discussion forum in Education?. This question will help us to think about the reasons for using discussion forum in Education" (CT2A3.12). (Post 9).	- Confirmation "Agreement". - Task process.
10	Asem	"I agree with Talal to stress on the use of discussion forum in Education" (CT2A3.12). (Post 10).	- Confirmation "Agreement".
10	Talal	"We need to answer this question to demonstrate the rationale for using this tool. It is important to focus our response on the learning process. By this way, we also can clarify the importance and the advantages of using this tool" (CT2A3.12). (Post 11).	- Task process.
11	Adham	No participation.	
11	Asem		
11	Talal		
12	Adham	No participation.	
12	Asem		
12	Talal		
13	Adham	No participation.	
13	Asem		
13	Talal		

Appendix 7: Transcription of group E's final product/Task 2

Iteration 2

Task (2): This task required students to create a podcast about the use of synchronous/asynchronous tools in Education or video narrative about using mobile phones in Education. The student participants were required to design an appropriate audio or video file that shows the group's product, clarifies expression and general presentation, and develops the ideas discussed in the discussion forum.

The three group members (Adham, Asem & Talal) participated to create a podcast about the use of discussion forum in Education for approximately 2 minutes using RealPlayer program. This audio recording is transcribed as follows:

- Adham:

"Hello everyone. This audio recording is the group E's final product of task (2) 1
for the subject *Producing and Using Instructional Tools*. The group members 2
(Adham, Asem & Talal) are providing a brief introduction about the use of 3
discussion forum in Education. This includes the definition of discussion 4
forum as an educational tool, the advantages and disadvantages of using 5
discussion forum in Education, the importance of using discussion forum 6
and the reasons for using this tool for educational communication... 7
I'm going to introduce the discussion forum as learning tool that can be 8
used in several educational environment. Discussion forum is a learning 9
tool that can be used for asynchronous communication between students 10
and with their teacher, especially for educational discussions, regardless 11
of time and place. This tool can be used in diverse learning environments. 12
Now, my colleague Asem is presenting some advantages and disadvantages 13
of using the discussion forum in Education". 14

- Asem:

"Hi everyone. The important advantage of discussion forum as learning tool 15
is that this tool can be used for open asynchronous communication with 16
disregard of time and place. This means that teachers or students can post 17
their threads or responses at anytime from anywhere. However, poor typing 18
skills could be one of the disadvantages.. Right now, the importance of 19
using the discussion forum in Education is introduced by our colleague 20
Talal". 21

- Talal:

"Hi everybody. To clarify the role of this tool in Education, it could be said 22
that .. umm.. Discussion forum can be used for general communication 23
which is important to reinforce commercial and social affairs. On the other 24
hand, it also is significant to be used for educational communication to 25
enhance the rapport between teachers and students. Now, we are going to 26
conclude this recording by the final part with our colleague Asem". 27

- Asem:

"Yes, I would like to finalise this work by arising this question: Why do we 28
use discussion forum in Education? We can answer this question by 29
saying ..like.. umm.. Using discussion forum in Education can facilitate the 30
learning process. For example, the teacher can post key questions of the 31
subject in the discussion forum for students at anytime. Students also can 32
respond to these questions at anytime.. Yes, that's all.. Thanks.. Bye" 33
(CT2B24.12). 34

Appendix 8: Group E's transcription of the chat tool/Tasks 1&2

Iteration 2

Task (1): This task required students to plan and discuss diverse topics with peers to create a website about the use of technology in Education. The student participants were required to design a proper website (including texts, images, links..etc) that shows the group's topics, demonstrates expression and general presentation, and develops the ideas raised in the discussion forum.

Tool: Chat.

The student participants were required to use this tool to collaborate with their group members and with the teacher to discuss the requirements of the tasks or difficulties in completing the tasks. Each group member was required to participate in five chat sessions in minimum over fifteen weeks of the semester as the chat sessions were organised by the teacher for one hour each week.

In this task, one student (Adham) participated in week 4 chat session (CT22.10), one student (Asem) participated in week 5 chat session (CT29.10), the three members (Adham, Asem & Talal) participated in week 6 chat session (CT5.11) and two students (Adham & Asem) participated in week 7 chat session (CT12.11). Chatting about the task is transcribed as follows:

Chat session	Transcript
Week 4 (CT22.10)	- Teacher:
	"Hello everyone. 1
	This chat is organised to discuss the requirement 2
	of task (1)". 3
	- Adham:
	"Let me tell you what I have understood of the first task 4
	requirement. I have understood that every group member 5
	should participate in five responses related to the topic, 6
	and then these responses are arranged to be submitted 7
	with the assistance of the group leader". 8
	- Teacher:
	"Yes, but the group leader also has other responsibilities 9
	to do. He encourages group work and participation, 10

	<p>distributes roles amongst the group members and sets the group goals. At the end, he submits the final task under the name of the group".</p> <p>- Adham:</p> <p>"Can you please explain how to discuss topics between the group members?".</p> <p>Teacher:</p> <p>"As mentioned in the lecture, each group member is required to discuss the topic with his group members in five participations at least in the discussion forum, and to participate in the chat and journal tools".</p> <p>- Adham:</p> <p>"Should these five participations be posted in the discussion forum at the same time?".</p> <p>- Teacher:</p> <p>"The responses should be sequentially posted based on your discussion about the topic. For example, you may discuss the main topic of your task in the beginning, and then you discuss the details. Remember, you have five weeks to discuss the first task from week 3 to week 7".</p>	<p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p> <p>26</p> <p>27</p>
Week 5 (CT29.10)	<p>- Teacher:</p> <p>"Hello everyone.</p> <p>This session is organised to discuss the requirement of task (1). I would like to know how is your work going?".</p> <p>- Asem:</p> <p>"I think the requirement of the task is generally clear. I would like to talk about our work on behalf of my colleagues if they don't mind". (They all agreed).</p> <p>Teacher:</p> <p>"Ok, Asem .. go ahead".</p> <p>- Asem:</p> <p>"In this task, we discussed the use of technology in Education as the main topic. We decided to focus on the definition of the use of technology in Education on our website and we will discuss other related topics such as the reasons for using technology in Education, the advantages and disadvantages of using technology, and the examples of technological tools in Education. What do you think guys about this?. We'll also discuss each area in more detail".</p> <p>- Teacher:</p> <p>"This sounds good, but the discussion should be sequentially addressed in the discussion forum and the details are clear. So, we can understand</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p>

	what you have meant by each area".	21
Week 6 (CT5.11)	<p>- Teacher: "Hi everyone. 1 Before we start our chat session, I would like to know 2 if anyone has any question or inquiry about the task. So, 3 we can discuss it here together. Today, we'll continue what 4 we have spoken about in the last session regarding the 5 first task and about the process of your group work". 6</p> <p>- Adham: "I would like to confirm what Asem has said in the last 7 session that our work is divided into sub-topics: 8 Definition of the use of technology in Education, the 9 reasons for using technology in Education, the 10 advantages and disadvantages of using technology in 11 Education, and the examples of technological tools in 12 Education. In this task, we'll try to connect these areas to 13 each other and to the main topic (the use of technology 14 in Education). So, if you have other suggestions guys to 15 improve our work, this will be appreciated, especially on 16 the sub-topics". 17</p> <p>- Teacher: "Do you have any additions?" 18</p> <p>- Talal: "Nothing to add". 19</p> <p>- Asem: "No essential edition, but I would like to remind other 20 group members that these areas or topics will be 21 discussed in the discussion forum, which means 22 all of you can see this. So, your feedback and comments 23 are welcome". 24</p>	
Week 7 (CT12.11)	<p>- Teacher: "Hello guys. 1 I would like to remind all of you about the important 2 of interaction and participation in the online tools 3 provided on Bb system. Also, remember that each 4 student should participate in this tool at least five 5 participations over the semester. So, please participate". 6</p> <p>- Adham: "Thanks for this reminder. 7 Could you please explain how this task is going to be 8 assessed?". 9</p> <p>- Teacher: "This task is assessed based on your ability to design an 10 appropriate website that includes texts, images, 11 tables and links. These elements should be related to 12 your topics you discussed in the discussion forum. I 13</p>	

	also want to see your developed discussion on the concepts. You can find the criteria of the task assessment in the copy of subject outline sheet that you have had in the orientation weeks".	14 15 16 17
	- Asem: "Is this task assessed based on group work or individual work?".	18 19
	- Teacher: "You'll receive marks based on group work, and every student will get the same mark for the tasks. However, individual marks may be assigned if necessary".	20 21 22

Task (2): This task required students to create a podcast about the use of synchronous/asynchronous tools in Education or video narrative about using mobile phones in Education. The student participants were required to design an appropriate audio or video file that shows the group's product, clarifies expression and general presentation, and develops the ideas discussed in the discussion forum.

Tool: Chat.

In this task, one student (Talal) participated in week 8 chat session (CT19.11) and one student (Asem) participated in week 11 chat session (CT10.12). Chatting about the task is transcribed as follows:

Chat session	Transcript
Week 8 (CT19.11)	<p>- Teacher: "Hi guys. In this session, we'll discuss the difficulties that you have faced during your discussion of the first task. I need to know all difficulties such as problems of the task requirement, problems of interaction within group or technical problems....etc".</p> <p>- Talal: "I find it difficult to present information in the discussion forum and discuss it with peers.. I mean the process of the task is quite difficult. I think it's hard for me because it's the first time to be engaged in this kind of learning environment. I also find it difficult to use online tools for learning".</p> <p>- Teacher: "What is your plan for the second task? How are you going to discuss it with your peers?".</p>

	<p>- Talal: "As the second task is about synchronous and asynchronous tools in Education, Our group decided to choose discussion forum as a topic for discussion. Does anyone have other suggestion?".</p>	<p>15 16 17 18</p>
Week 11 (CT10.12)	<p>- Teacher: "Hello everyone. Does anyone have any questions about the second task? I would like to hear from all of you how you are going to discuss task (2) with your peers".</p> <p>- Asem: "I would like to confirm what Talal has said in the last session that the topic of our work is the discussion forum as learning tool. We suggested some alternatives to support our topic such as the importance of using discussion forum in Education, and its advantages and disadvantages. Can anyone give us feedback on these?".</p>	<p>1 2 3 4 5 6 7 8 9 10</p>

Appendix 9: Group E's transcription of the journal tool/Task 1

Iteration 2

Task (1): This task required students to plan and discuss diverse topics with peers to create a website about the use of technology in Education. The student participants were required to design a proper website (including texts, images, links..etc) that shows the group's topics, demonstrates expression and general presentation, and develops the ideas raised in the discussion forum.

Tool: Journal.

The student participants were required to use this tool to reflect on the content of the subject and their own learning. In this task, two members (Adham & Talal) used this tool to reflect on their own collaborative learning within their group work to complete task (JT22.10, JT29.10, JT5.11). The students' participations are transcribed as follows:

Week	Transcript
Week 4 (JT22.10)	<p>- Adham: "Collaborative learning process assists us to understand the concept of the task and to finalise our product".</p> <p>- Talal: "The completion of task becomes much easier within group work".</p>
Week 5 (JT29.10)	<p>- Talal: "Teamwork allows to understand the content of the subject and simplifies the requirements of the task".</p> <p>- Adham: "Collaborative learning environment encourages the members to complete the task without any boredom, and makes them more motivated".</p>
Week 6 (JT5.11)	<p>- Adham: "Collaborative learning is useful for me, but I feel it is difficult sometimes to</p>

	<p>share all information that I have with my colleagues in the discussion forum".</p> <p>- Adham: "The teacher role is important to support student collaboration, and I think that the teacher's questions posed in the discussion forum helps understand the requirements of the task".</p>
--	---

Appendix 10: Interview guide for the student interviews

Students' cultural/ social backgrounds.
What are your parents' education levels?
How many your family members?
What was your type of learning in high school?
What was your specialisation in high school?
What is the rate of your parents' monthly income?
What is your parents' occupations?
Did you have any course in computer skills?
Did you have any online course during your studies in previous schools?
Have you ever gained any information about technology? If yes, how?
Students' beliefs about technology/collaboration.
Do you use the internet?
How many hours do you use the internet a week?
What are the websites that you prefer to visit?
Do you like collaborative learning?
Do you like to use technology in learning?
Do you prefer to discuss topics in the class with the teacher or with your peers?
Which collaborative tool did you prefer to use on Bb system?
Difficulties
<p>Have you faced any difficulties during your engagement with the learning environment? For example;</p> <ul style="list-style-type: none"> - Difficulties with computer - Difficulties with Bb system/tools - Time difficulties - Difficulties in communication with your group - Technical support difficulties

Appendix 11: Information sheet (Arabic)

معلومات البحث

عنوان البحث: التعلم التعاوني في بيئة التعلم الممزوجة (وجهها لوجه + تعليم الكتروني) لطلاب المرحلة الجامعية في بيئة عربية (المملكة العربية السعودية).

الغرض من البحث: يهدف البحث إلى قياس وفحص التعلم التعاوني لطلاب المرحلة الجامعية باستخدام طريقة التعلم المدمج (التعليم التقليدي + التعليم الإلكتروني) في المملكة العربية السعودية. وهذا البحث يهدف أيضاً إلى دراسة الكيفية التي يمكن لأدوات التعلم الإلكترونية التعاونية أن تدعم تعلم الطلاب، ومن خلال هذه الدراسة سوف يكون هناك اهتمام خاص في بحث العوامل السياقية والثقافية التي يمكن أن تدعم أو تعيق تعلم الطلاب في بيئة التعلم المدمج من خلال فصلين دراسيين من البحث.

إجراءات البحث:

الطلاب المشاركون في هذا البحث يجب عليهم التسجيل في مادة إنتاج واستخدام الوسائل التعليمية (وسل 201) حيث سيقوم البحث على أساس مشاركة الطلاب في الأنشطة والواجبات المتعلقة بهذا المقرر الدراسي. لإجراء البحث سوف تجرى ثلاث مقابلات شخصية لكل طالب لمدة عشرين دقيقة قبل وأثناء وبعد الانتهاء من المقرر الدراسي على أن تسجل هذه المقابلات صوتياً حتى يتم جمع البيانات والمعلومات الضرورية التي تدعم أو تمنع استخدام برنامج الويب سيتي (Blackboard) الذي سوف يستخدم كأداة لتعزيز التعلم الإلكتروني. هذه المقابلات سوف تكون حول عدة محاور خاصة بالطلاب المشاركين في البحث مثل العوامل الثقافية والاجتماعية، تصورات الطلاب حول استخدام الانترنت، الصعوبات التي قد يواجهها الطلاب أثناء استخدام التكنولوجيا، العوامل الشخصية التي قد تؤثر على استخدام التكنولوجيا في التعليم بالإضافة إلى تمييز الأدوات التعليمية التعاونية التي يفضلها الطلاب أثناء استخدامها للبرنامج الإلكتروني البلاك بورد (Blackboard) خلال الفصل الدراسي. سوف يقوم الباحث أيضاً بملاحظة أداء الطلاب داخل القاعة الدراسية وتفاعلهم مع بعضهم البعض أثناء استخدام برنامج البلاك بورد (Blackboard).

معلومات هامة حول البحث:

- 1- مشاركة الطلاب في هذا البحث هي مشاركة اختيارية ويمكن لأي طالب الانسحاب من المشاركة في البحث بدون أي أضرار مترتبة على ذلك.
- 2- رفض المشاركة في هذا البحث لن تؤثر على علاقة الطالب بأستاذ المقرر الدراسي.

أشكركم على تعاونكم،،،

الباحث/

عمر بن عبد الوهاب السماعيل
كلية التربية
جامعة ولونجونج باستراليا

Appendix 12: Interview guide for the student interviews (Arabic)

الخلفية الثقافية والاجتماعية للطالب.
ما هو المستوى التعليمي للوالدين؟
كم عدد أفراد الأسرة التي تنتمي إليها؟
ما هو نوع التعليم في المرحلة الثانوية؟
ما هو الدخل الشهري للوالدين؟
ما هي طبيعة عمل الوالدين؟
هل حصلت على دورات تدريبية في الحاسب الآلي؟ إذا كانت الإجابة بنعم، متى؟ وكيف؟
هل تلقيت أي نمط للتعليم الإلكتروني أثناء مراحل دراستك السابقة؟
تصورات الطلاب ومعتقداتهم حول الانترنت/ التعلم التعاوني
هل تمتلك جهاز كمبيوتر (شخصي، في العمل، أخرى)؟
هل تستخدم الانترنت؟ (نعم - لا)
ما نوع استخدامك للانترنت؟
ما هي درجة استخدامك للانترنت؟ كم ساعة في اليوم أو الأسبوع؟
هل تحب العمل الجماعي أو التعلم التعاوني؟ (نعم - لا)؟ لماذا؟
هل تحب استخدام التكنولوجيا في التعلم؟ لماذا؟
ما هو نمط المناقشة أو التفاعل المفضل لديك داخل الصف؟
الصعوبات
هل واجهتك صعوبات أثناء استخدامك لأدوات التعلم الإلكترونية التعاونية؟ مثل:
- صعوبات تتعلق بجهاز الكمبيوتر
- صعوبات تتعلق باستخدام الأدوات الإلكترونية التعاونية
- صعوبات في الوقت المتاح لإنجاز المهام
- صعوبات في تنفيذ المهام التعاونية المطلوبة
- صعوبات في التفاعل مع أعضاء المجموعة
- صعوبات تتعلق في التسهيلات التقنية أو الفنية

-FIN-