

**Conditions affecting Computer Supported Collaborative
Learning in Higher Education in the UK and South Korea**

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ABSTRACT

The purpose of this research is to explore CSCL as an instructional model for developing the skills and competencies required in the 'knowledge society' and to suggest under what conditions CSCL might be effective. To this end, an in-depth investigation of students' collaborative interaction patterns, their perceptions of their learning and the variables impacting on their interaction was conducted. The four contexts of study looked at alternative communication tools, collaborative task types and distance versus campus modes in South Korea and the UK. Data collection from these diverse contexts adopted a mixed methodology. Data analysis initially focused on the first two case studies and was then extended across the remaining contexts which explored alternative tasks and media. Students' collaboration patterns indicated that students input more effort on doing the work for which they were individually accountable rather than toward a group effort. The process of negotiating meaning was found to be weak in asynchronous online discussion and the most difficult aspect of group project tasks for students. Students' socio-emotional aspects also influenced collaboration patterns. Nevertheless, students' perceptual data indicated that they believed CSCL had diverse learning merits. In conclusion, some conditions for effective CSCL design were suggested.

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LIST OF ABBREVIATIONS

AOD : Audio On Demand

BECTA: British Educational Communication and Technology Agency

CAI: Computer Assisted Instruction

CSCL: Computer Supported Collaborative Learning

DfES : the Department for Education and Skills

DVD: Digital Versatile Disc

ESA: Exchange Structure Analysis

FTA: Free Trade Agreement

FTP: File Transfer Protocol

GATT: General Agreement on Tariffs and Trade

HEFCE: Higher Education Funding Council for England

HEI: Higher Educational Institute

ICT: Information & Communication Technology

ITS: Instructional Tutoring System

JISC: Joint Information Systems Committee

KEDI: Korean Educational Development Institute

KERIS: Korean Education & Research Information Service

KOCW: the Korean Open Course Ware

LMS: Learning Management System

MEHRD : The Ministry of Education & Human Resource Development

MEST: The Ministry of Education, Science & Technology

MoKE: The Ministry of Knowledge Economy

OECD: Organization for Economic Cooperation and Development

OU: Open University

PCER : The Presidential Commission on Education Reform

QAA: The Quality Assurance Agency for Higher Education

TEL : Technology Enhanced Learning

UCISA: The Universities and Colleges Information Systems Association

VLE : Virtual Learning Environment

VOD : Video On Demand

WTO : World Trade Organization

ZPD : the Zone of Proximal Development

CHAPTER 1

INTRODUCTION

Today we live in is a rapidly changing, highly competitive, globalized knowledge society. It is claimed that to take the leading position in this era or even survive economically, knowledge, education and learning are critical issues at the national, organizational and individual level. In this era, governments and institutions of higher education have implemented reform policies to improve the quality of higher education, to build a highly skilled workforce and to expand learning opportunities. This reform is based on the premise that students require critical thinking skills, problem-solving skills, networking and team-working skills, ICT proficiency and the ability to become self-directed learners, as well as experts in their subject area.

Whilst, on the one hand, ICT skills are considered among the new skills that learners require, ICT in the form of e-learning has also been considered one of the solutions, in enabling students to acquire new skills by providing more flexible learning opportunities for a wider population and enhancing the quality of the teaching and learning experience.

Adult learners, in particular, can more easily access life-long learning opportunities to renew or upgrade their skills and competencies without the constraints of time and space. In traditional campus-based higher educational contexts, e-learning components are blended with classroom teaching, thus supporting conventional classroom teaching by providing more flexible access to course materials and more convenient interaction opportunities. However, contrary to the radical expectation that traditional campus-based universities will be replaced by virtual campuses, the courses which completely substitute e-learning for classroom teaching remain small in number.

Researchers are not sure whether e-learning has made any deep and innovative changes in teaching and learning practice. In general, e-learning has mainly been used for knowledge transmission to individual learners. Most e-learning content was developed by replicating traditional lecture style teaching in virtual space without fully exploiting the potential of e-learning for other kinds of interaction. Therefore, e-learning is sometimes criticized for being a second-rate educational tool which lacks the kinds of interaction felt to be critical for high quality learning. This implies that merely adopting technology does not make for good innovation in education, if there is no accompanying change in the learning paradigm, a new teaching-learning model, or a change in the perspectives of tutors and students' on their roles in the learning process and surrounding support systems (Bielaczyc, 2006).

In 1996, Computer Supported Collaborative Learning (CSCL) appeared as a new learning paradigm for educational technology research. CSCL adopts a different perspective on learning and the use of learning technology. It is based on a mainly social and constructive learning theory, which emphasizes knowledge construction through social interaction or collaboration. Therefore, the learning technology is used for supporting social interaction or collaboration alongside the individual's self-paced learning.

Computer support for collaborative learning can take diverse forms. Until now, the most popular forms of computer support have been a computer mediated communication and a shared working space for collaborating groups. Since the advent of CSCL, a number of research studies have been conducted. The most frequently reported research is of asynchronous online discussion in both campus-based courses and online distance courses. Recently, the use of shared working spaces such as Wikis has also been reported, but it remains comparatively rare.

Although diverse research topics have been studied in CSCL research, most of it has concerned what is taking place in online discussion. The archived nature of online discussion transcripts makes it possible for researchers to examine students' interaction patterns in specific CSCL contexts. Researchers commonly adopt content analysis methods to analyze the quality of online discussion transcripts. Researchers have focused on learning and cognitive processes at a group level, rather than learning outcomes at an individual learner level, because this gives them an insight into the processes of collaboration, as distinct from the products of learning.

However, research results have sometimes shown inconsistency or contradiction: although evidence of collaborative processes (e.g. shared knowledge construction) has been sought, they have not always been evident. As Lipponen (2002) contends, CSCL studies vary in the characteristics of students, course design, tutor's role, the length of study and many other local contextual factors. The quality of interaction can be influenced by various interactions between contextual variables. Moreover, most research has analyzed the quality of the interaction without exploring why the interaction patterns occurred or what kinds of learning they evidenced. Without such analysis it is not easy to judge how to improve students' learning through CSCL design.

Content analysis of online discussion transcripts or constructed artifacts is a useful method, but it has limitations in fully enabling us to understand students' learning because students' cognitive processes may not be completely reflected in them. As Kanuka and Anderson (1998) note, online discussion transcripts reveal only part of the cognitive process occurring during CSCL. They point out the limitation of transcript analysis of being based on the assumption that knowledge construction is an observable process.

As Salomon and Perkins (1998) argue, collaborative learning or CSCL involves social learning aspects and individual learning aspects; however, researchers have been more inclined to study the social aspects of learning, which may have led them to ignore or undervalue the individual aspects of learning taking place in CSCL contexts. Hakkinen and Jarvela (2006) suggest a more balanced approach to the study of CSCL: to include individual student's learning as well as collective learning in CSCL settings.

One approach which may help us better understand the effectiveness of CSCL or 'what is taking place' in CSCL, is to include individual students' perceptions of their experience - in addition to analyzing their patterns of interaction. Therefore, this research combines students' collaboration patterns and their perceptions to try to gain a more holistic understanding of what is taking place in CSCL and the effectiveness of CSCL for developing the skills and competencies needed for a rapidly changing knowledge society.

In CSCL research, either the individual tutor or the institution has taken the decision to adopt technology, often without the direct involvement of students in the design choices. Students' perception of the merits and limitations of the adopted technology are therefore critical in evaluating the suitability of the technology for supporting student learning. Sharp et al. (2006) state, however, that student perspectives are under-represented in CSCL research.

This research conducted four case studies, located in different local learning contexts. The research questions are listed below:

- What are the characteristics of students' participation and interaction patterns in the CSCL?

- In the opinion of students, does CSCL benefit learning? If so, what are the perceived learning benefits?
- What are the perceived merits and limitations of CSCL in the four local contexts?
- How might contextual factors affect student participation and collaboration patterns? Or how might these factors interact with each other to produce the specific features of the patterns of interactions?
- What are the potential consequences of the findings for designing CSCS, in particular, for creating the necessary conditions for effective CSCL?

To address these research questions, four learning contexts were studied in the UK and South Korea. The four cases have some common traits, in that they are all post-graduate courses which adopted information technology to support collaborative learning. However, they are different in their socio-cultural contexts, institutional contexts and course contexts.

First, the cases are located in two different socio-cultural contexts: the UK and South Korea. The growing number of international students and the undertaking of global online courses or computer supported collaborative projects have gradually drawn researchers' interest to cultural differences in e-learning design (Henderson, 1996; Liang and McQueen, 1999; Chase et al, 2002; Hudson, Hudson and Steel, 2006). In general, the UK is a Western culture and South Korea is influenced by an Asian-Confucian culture. As globalization proceeds, the UK universities are recruiting many international students. The UK is ranked second of the countries of the OECD in the number of international students enrolled in higher education (2009, OECD). Hence there is an urgent need for researching how international students participate in and perceive CSCL. However, there has been little

research on online discussion amongst students with multi-national backgrounds in the UK context. In this research, case study 1 involves students from multi-national backgrounds: among the 12 enrolled students, the native UK students number only 3 and the other 9 students are from elsewhere. Therefore, although the sample size is small, the comparison of interaction pattern and perception in CSCL could give insights into issues for designing multi-national e-learning courses and contexts.

Second, there are two institutional contexts. The UK university, in which cases 1 and 3 were located is a traditional campus-based university where the use of online learning tools supplements face-to-face teaching. In contrast the South Korean graduate school in which cases 2 and 4 were located is a virtual campus which specializes in distance learning.

Third, there are two different types of collaborative group task: asynchronous online discussion and a group project task. Whilst the main study comparison for this research is between the UK and South Korean groups using asynchronous online discussion (the most common form of online collaborative learning), cases 3 and 4 extend the study to look at whether common themes emerge in group project tasks using alternative communication tools.

The ability to work in groups using computer mediated communication tools or groupware is a requirement in today's working life. With the influence of globalization, organizations (in particular, multinational companies) are forming virtual project teams which interact primarily via electronic media or shared working space. The two group tasks in this study differ in the extent of task interdependence in completing the task. This is expected to influence the intensity of group interaction and in turn students' perceptions of the given task (in particular, online distance learners who are constraint by time). Therefore it may be

expected that the location of the students (distance or campus-based) and the type of collaborative task they are engaged in may interact with and affect students' perception and engagement with particular online tools.

For example, in general, online distance learners who have limited opportunities for interaction are expected to perceive positively the value of asynchronous online discussion or a group project task. In contrast, adult online distance learners may be more attracted to the online module's flexible and self-paced learning opportunities, bearing in mind their congested schedule. In a group task, the work of individuals is more dependent on that of others; therefore, students may find self-paced learning difficult. In such conditions, collaborative learning opportunities may not be welcomed or the students may not perceive the anticipated learning merits. There are, therefore, some commonalities and differences which may lead to differences in the perceived benefits and limitations of CSCL in these different contexts.

Last but not least, each case is located in a different context at the micro-level: differences in the ICT supporting tools, tutor's role, student characteristics, and course design. In the group project task context (cases 3 and 4) alternative collaborative communication media are used: in case study 3, a Wiki is used to support a campus-based course where students also work on a school placement; whilst in case study 4, a synchronous online discussion tool is adopted (in preference to more common asynchronous discussion tools) in an online distance course. These alternative tools might be expected to overcome some of the previously reported limitations of asynchronous discussion. Wikis make possible the joint online construction of a written product, whilst synchronous online discussion enables immediate feedback when negotiating collaborative activity. However, perceived

affordances and limitations might also be expected to differ across the different cultural, institutional and micro course context.

Although the four cases are not exhaustive examples of CSCL, each can be seen to have a distinct research value as a representative of the diverse types of CSCL. The differences in the contexts of the four case studies are shown in the table 1. Detailed descriptions of individual contexts are attached (see Appendix 1).

<Table 1> Overview of four cases

<i>Case 1</i>	<i>Case 2</i>	<i>Case 3</i>	<i>Case 4</i>
Asynchronous online discussion in a campus-based course in the UK	Asynchronous online discussion in an online distance course in South Korea	Group design project supported by Wiki in a campus-based course in the UK	Group research project using online chat discussion in an online distance course in South Korea

By conducting four case studies, my research seeks both an in-depth understanding of individual cases and attempts to find commonalities which act across all four case studies. However, it is noted that the contextual variables interact with each other; therefore, in some instances it may not be possible to determine what are the major factors influencing outcomes or perceptions. Although limited, I hope to gain some insights into the relative importance of such factors through rich contextual case description.

For this research, I adopted a pragmatic approach, believing that researchers can use whatever philosophical or methodological approach seems to fit their research purpose best (Tashakkori and Teddlie, 1998, p. 12). Qualitative and quantitative data collection and data analysis were used. The four case studies used a mixed method approach according to the

pragmatic needs of the individual case and local constraints. For example, various types of focus group were used according to the case contexts: an asynchronous online focus group in case study 1, a synchronous online focus groups in case study 2 and face-to-face focus groups in case study 3.

The following chapter, Chapter 2, discusses the macro-level context: e-learning policy and the current state of e-learning in higher education in the UK and South Korea.

Chapter 3 presents a review of the collaborative learning paradigm in relation to the e-learning literature and discusses the findings from related CSCL research in higher educational contexts.

Chapter 4 provides a general description of the methodology adopted in this research. More detailed data collection methods will be described in individual case study chapters.

Chapters 5 to 10 provide the empirical research results of the four case studies.

Chapter 5 is a report of an asynchronous online discussion in the UK campus-based course in which multi-national background students were enrolled.

Chapter 6 reports an asynchronous online discussion in the South Korean online distance course.

Chapter 7 provides the findings of a comparison between the two asynchronous online discussion case studies.

Chapter 8 presents the findings from the two group projects. Case 3 reports a geography lesson design task using a Wiki in the UK campus-based course. Case 4 reports a group

research project task using synchronous online discussion in the South Korean online distance course. Later, the two project results are compared.

Chapter 9 presents an overall comparison of the four case study results. It goes on to conclude the research with a discussion of its implications for theory and practice and the strengths and limitations of the research, including recommendations for further study.

CHAPTER 2

E-LEARNING POLICY AND THE CURRENT STATE OF E-LEARNING IN HIGHER EDUCATION IN THE UK AND SOUTH KOREA

The aims of this chapter are to introduce the policy-related context which has led both the UK and South Korea to adopt e-learning, to compare and contrast the aims and strategies of e-learning policy and to survey the current state of development of e-learning in higher education in the UK and South Korea.

2.1. The wider context of e-learning adoption in the UK higher education

The drivers for e-learning adoption in UK higher education have tended to come from external pressures on higher education together with internal motivation to improve the quality of learning (Dearing, 1997; Goodison, 2001; Souleles, 2004). External environmental changes and the resulting pressures on higher education include a perceived shift toward a 'knowledge-based society', i.e. globalization leading to increasing international competition, the decline of the workforce needed for traditional manufacturing industries in OECD (Organization for Economic Cooperation and Development) countries and their replacement with service industries and new technology growth industries in which intellectual skills are held to be at premium.

The 'knowledge society' (Drucker, 1968) refers to a society where the creation, dissemination and use of knowledge are major ways to gain national prosperity and well-being. The knowledge society is characterized by a marked shift away from the production of traditional manufactured goods toward a service-based economy dependent upon

highly-skilled professional services and high-end technologies. The knowledge society is also referred to as a learning society, because the survival and success of individuals, corporations and countries depend on their ability to create innovative knowledge and to learn new skills (David and Foray, 2001).

Globalization refers to a process by which regional economies, societies and cultures have become integrated through world-wide networks of exchange. In particular, globalization in the economic context has reduced or removed barriers between nations to speed the flow of goods, capital, services and labour through international agreements and organizations, such as GATT (General Agreement on Tariffs and Trade), the Uruguay Round and the WTO (World Trade Organization). In the globalized economy, elements of production can move anywhere to seek out more profits; it is a time of borderless competition, drastic change, chaos, uncertainty and discontinuity. Therefore, nations, corporations and individuals required increased adaptability and innovation for their survival (OECD, 2010).

This change in the external environment has suggested a more critical role for higher education in securing the nation's economic future, by not only producing world class research but also educating a much larger proportion of the workforce to be highly skilled. For the latter to be achieved, it is argued, learning opportunities should increase for adult learners who want to upgrade their skills and knowledge and who will need to do so continuously through flexible ways of learning throughout their lives if they are to keep pace with the rate of technological change (Field, 2006).

These external pressures in turn create internal pressures for example, through changes in student background. As higher education has changed throughout the last decade away from elite education toward mass education, students have more diverse backgrounds with

different educational needs. This places pressure on higher education institutions to provide more support and different kinds of support to maintain the quality of its graduates. Another motivation to adopt e-learning has therefore come from the perceived need to enhance the quality of teaching support in higher education. Traditionally, UK higher education has placed great emphasis on research: funding systems have rewarded research excellence. However, the last government began to recognize the importance of also rewarding high quality teaching in higher education through the funding system and HEFCE and QAA reviews of the quality of teaching, learning and assessment (Zamorski, 2002). Hence, higher educational institutions have focused more on the quality of students' learning experience and some have used ICT as a way of supporting and enhancing student learning (Goodison, 2001; Souleles, 2004).

These external and internal pressures have contributed to adopting e-learning in a flexible way to expand higher education learning opportunities and to improve the quality of teaching and learning in higher education (Phipps and Merisotis, 2000)

2.2. The aims and strategy of e-learning in UK Higher Education

Diverse government documents announce the aims and strategies of ICT use in education. The need for ICT use in education was first announced in the 'Dearing Report' in 1997. This described the current status of UK higher education and the challenges faced at the outset of the new millennium. It recommended a long-term strategy to the government in response to the increased demand for higher education. For this, the use of communication and information technology was recommended as a way to improve the quality of learning and to provide more flexible access to higher education, in particular for those students with a non-traditional background, who have to combine learning and work. It included

some more specific guidelines for adopting ICT, saying that all higher education institutions have overarching communication and information strategies by 1999/2000 (recommendation 41), and that should ensure all students had open access to a Networked Desktop computer or their own portable computer by 2005/6 (recommendation 46).

Moreover, the Secretary of State for Education and Skills in 'The future of higher education' (2003) suggested that there was a need to increase higher education opportunities to meet the needs of students and the economy. This document had the goal of raising higher education participation to 50% by 2010, mainly through two-year work-focused foundation degrees. To correspond to this increased educational need, it recommended increasing the number of part-time courses and other forms of flexible learning. The use of ICT and e-learning was considered a key way of providing such flexible learning.

In 2005, the Department for Education and Skills (DfES) published an e-learning strategy document: 'Harnessing Technology; transforming learning and children's service'. The strategy covered schools, post-16 and life-long learning, higher education and children's services. Its objectives included: 1) transforming teaching and learning to meet the learners' highest expectations: 2) connecting with hard to reach groups through increased personalization, choice, flexibility and independent learning: 3) more information and services online and more cross-organizational collaboration to improve personalized support and choice: and 4) moving to a new level of efficiency and effectiveness. To implement the strategy, DfES collaborated with BECTA (British Educational Communication and Technology Agency) and JISC (Joint Information Systems Committee). DfES were charged with strategic direction and policy development, while

BECTA and JISC had the role of coordinating the delivery strategy¹.

An influential document for e-learning adoption in higher education was ‘HEFCE strategy for e-learning’ in 2005. Its aim was to support tools for benchmarking higher education institutions in setting their own e-learning goals and ways of embedding e-learning appropriate to their mission and context. Strategies, therefore, were focused on providing and sharing pedagogy, best practice and strategies.

Its implementation strategies included: 1) pedagogy, curriculum design and development by rewarding excellence and producing and disseminating models of good e-learning practice: 2) developing and enhancing the quality of digital resources and tools for learners, sources for teaching and research: 3) promoting strategic management, human resources and capacity development: 4) contributing to understanding and appreciation of the wider issues posed by e-learning through research and evaluation: and 5) developing infrastructure and technical standards for increased capacity to deliver high quality learning and for the interoperability of materials in order to promote sharing and progression (pp. 10-17).

To summarize, e-learning in UK higher education has been adopted for the purpose of improving the quality of learning and widening access to higher education by providing more flexible and personalized ways of learning, for the traditionally hard to reach groups, in particular. For these purposes, the strategies of e-learning in higher education focus on supporting individual higher education institutions in setting their own goals and ways of

¹ Note: at the point at which this thesis was submitted a newly elected government has announced the disbanding of BECTA and a major overhaul of higher education funding including HEFCE funding. It is uncertain how this will affect external drivers toward the use ICT in higher education in the future.

embedding ICT tools to suit their unique context and by sharing best practice rather than direct intervention.

2.3. The current state of e-learning in Higher Education in the UK

E-learning adoption in campus-based universities has been widespread and a kind of blended approach is the main model. In this model, e-learning is seen as a supplement to classroom teaching.

UCISA (the Universities and Colleges Information Systems Association) has been conducting a longitudinal survey of VLE use in UK higher education and has reported figures for 2001, 2003 and 2005. According to the 2005 survey (response rate 41%, 85 out of 206 HEIs), 95% of higher education institutions were operating at least one virtual learning environment. The proportion reporting VLE operation had previously risen from 81% in 2001 to 86% in 2003 showing a consistent upward trend.

E-learning plays a complementary role as an additional tool for classroom teaching but does not replace it. The UCISA survey divides e-learning into three sub-categories; 1) web-supplemented, in which online participation is optional for students: 2) web-dependent, in which students are required to participate in an online component of a face-to-face course (this may involve individual interaction with content, communication with staff/students, or both interaction with content and with staff/students): 3) fully online courses. When the three categories were applied, category 1), web-supplemented practice, was shown to be the leading activity (48%) and fully online courses occupied a minority (4%). The 2008 survey result remained consistent with the findings of the 2005 survey: web-supplemented courses rising to 54% and fully online courses to 6%.

Sharpe et al. (2006) review the research on and practice in blended e-learning in the UK. They find similar usage patterns: currently the most common type of blended learning is the provision of supplementary resources through an institutionally supported virtual learning environment.

Recently, more diverse new technologies have been used to enhance teaching and learning. In the UK context, the definition of e-learning has been used broadly and flexibly to encourage exploiting full potential of ICT in teaching and learning practice. Therefore, 'HEFCE strategy for e-learning' in 2005 described e-learning as "any learning that use ICT" (p. 5).

In the 2008 UCISA survey, the title changed from 'VLE (virtual learning environment) use' to 'TEL (technology enhanced learning) use' to capture the expected enhancing role of technology in learning and the prevalent use of new technology (especially web 2.0) in addition to VLEs. Here, TEL is defined as "any online facility or system that directly supports learning and teaching. This may include a formal VLE, an institutional intranet that has a learning and teaching component, a system that has been developed in house or a particular suite of specific individual tools" (Browne et al., p.2). In the review report of HEFCE's strategy for e-learning, Palmer (2009) also indicated that terminology, practice and contexts have all changed since the first edition of HEFCE's strategy for e-learning in 2005: therefore, the focus should now be placed on the enhancement of teaching, learning and assessment and the way in which technology might be able to support this focus.

According to the 2008 UCISA survey, students used diverse centrally supported technologies in addition to VLEs. The top five software tools were e-assessment, blog, podcasting, e-portfolios, and Wikis. Students also used diverse non-centrally supported

tools: Blog, Wiki, podcasting and social bookmarking are what they use most often. Higher educational institutions perceived new demands in terms of support from users on streaming media and large media files, mobile computing, podcasting and web 2.0.

JISC's recent report on the learner experience of e-learning (Sharpe et al., 2009) reveals how effectively digital learners blend diverse personal technologies with those provided by institutions or by course tutors in their learning processes. They use cameras, video phones, iPods, MSN Messenger, Skype, Wikipedia and social software (such as My-Space). The Internet and Google search engine are pre-dominantly the information sources for most learners, Wikipedia rather than course textbooks is frequently cited as a source of definitions, and they seek advice from informal social networks which they create through mobile phones, email, Skype and instant messaging. However, students rarely used the discussion boards embedded in course VLEs. This brings a new challenge to institutions and course designers, who must respond to these changes in technology use by exploring the potential of the technologies in their learning processes which students prefer, in order to close the gap and give students more of what they have come to expect.

Although the use of online learning for distance education courses run by UK universities is still (relatively) underdeveloped in comparison with countries like South Korea (for reasons which are explained in the next section), a key exception is The Open University (OU, www.open.ac.uk). The OU was established in 1969 with the mission of opening education to people, places, methods and ideas. Since its establishment, it has provided higher education opportunities to more than 2 million students. The OU uses a range of old and new learning technologies and media to integrate e-learning into its courses. It chooses technologies which best meet the learning objectives and the needs of students. At present,

for its course delivery it uses the Internet, interactive DVDs, CD-ROM, email and computer conferencing. Other universities in the UK are increasing the range of courses they offer online and at a distance but these courses remain few and innovative, often in IT related subjects or in niche specialist areas and a comprehensive prospectus of subjects is not offered in a similar way to that of the OU.

Stakeholders' perception of e-learning

The HEIs, students and instructors seem to recognize that e-learning is now a mainstream activity.

According to the 2008 UCISA survey, the top five incentives to adopt ICT in higher educational institutions were: 'enhancing the quality of learning and teaching', 'meeting student expectations', 'improving access to learning for students off-campus', 'widening participation/inclusiveness' and 'improving access to learning for part-time students'.

How, then, do students perceive e-learning use? Do students really perceive e-learning as helping to enhance their learning experience?

Sharpe et al. (2006) reviewed the literature on undergraduate students' experience of blended e-learning. Students' responses were overwhelmingly positive with regard to blended e-learning, which provides online course information to supplement traditional teaching. Their experience was enhanced by flexible access to course materials from the VLE at a place and at a time which suited them. The most preferred content was lecture notes, because these enable students to catch up when they have missed sessions. Overall, students felt that e-learning enhanced their learning through the improved delivery of teaching materials, improved access to learning resources and better communication.

However, their experience of online communication and collaboration did not report consistent results. There seemed to be difficulties in undergraduate students' engaging at the level of dialogue expected.

Regarding the barriers to e-learning, students perceive time management as a primary concern to engage in e-learning (Sharpe et al., 2006). Even though it gave them flexibility of time and pace of study, students needed to adapt and reconstruct their approach to time management to adjust to the e-learning mode. Students experienced some feelings of frustration for a wide range of reasons, including trying to fit study into their lives, navigating online resources, coping with outdated materials or adjusting to a changed or innovative pedagogy (e.g. the conditions of working collaboratively).

How do lecturers' perceive e-learning? Wilson's survey (2003) conducted in 2001/2002 shows variation in lecturers' perceptions. Some felt negatively that electronic lecture notes and online tutorials can actually inhibit learning: others felt that the e-learning medium alone cannot provide a pedagogically enhanced environment and therefore, must be accompanied by classroom teaching: and some enthusiastic proponents felt e-learning had the potential to increase the learning opportunities for students. However, adopting e-learning was recognized as a general trend. Of the lecturers who did not currently use e-learning, most were considering using it in the future (75% - 79%).

Diverse barriers for instructors in adopting e-learning were reported. A lack of time to develop materials, lack of knowledge and understanding of ICT, lack of technical support, concern about students' ICT skills (Naidu, 2004; Wilson, 2003). In the 2008 UCISA survey, the five top barriers to developing TEL (Technology Enhanced Learning) tools were: lack of time, lack of knowledge among academic staff, lack of money, institutional culture and

lack of support staff.

The OECD report (2005) also revealed a resistance from the faculty to e-learning: a professional culture of academics based on autonomy and a reward system based on research, concern about intellectual property, perceptions of the limitations of e-learning, insufficient maturity of the tools available, lack of time or motivation to carry out what is basically an additional task to classroom teaching, insufficient literacy in ICT or e-learning applications. Although many of the issues from this 2005 study appear unchanged in the UCISA 2008 survey, a trend toward increased engagement can now be seen, with e-learning from staff and less concern for the maturity of the tools: limiting factors would seem to be those of time to develop resources, technical support and staff training.

In the following section, the context of e-learning adoption, the aims and strategies for adoption and the current state of e-learning use in higher education in South Korea are presented.

2.4. The development of Higher Education in South Korea

In South Korea, education has been the prime driving force for national development over the last several decades. Since independence from Japanese colonial rule after the Second World War, Korean education has made remarkable progress in quantitative terms across all its stages. As of 2010, the participation rate in schools reached nearly 100%: 98.6% in primary school: 97.6% in lower-secondary school and 92.4% in upper-secondary school. Higher education also increased sharply. In 1945, there were 19 higher education institutions (HEIs) and 345 enrolled students. In 2010, there were 411 HEIs and 3,644,158 enrolled students. In 2010, the participation rate in higher education was 70.1% and the rate of high school graduates advancing to higher educational institutions was 81.5% (KEDI, 2010).

This astonishing growth has been made through the application of government policies and Korean people's enthusiasm for education. In this country, higher education has developed under the strong initiative of government policies. This is in contrast to the American or European universities, which developed autonomously. The Korean government established diverse types of national university and intervened in and controlled higher education. From the 1960s to the 1980s, in particular, higher education developed with close links to economic development.

The Korean people's enthusiastic attitude toward education has a socio-cultural and historical background. Before the modernization of Korean society, educational opportunity was restricted to the upper class, above all as a means for passing the examination to become a government official, the traditional governing class. Moreover, the people in academia were more highly respected more than people in more technical and

vocational occupations. After the abolition of the previous class system, higher education began to be considered as a means of raising one's social status and no longer as the mark of a particular social class. Entry to the prestigious universities has been the greatest educational desire of Koreans for their children, because of the close correlation between education and the status of one's occupation and income in society. Some have argued that this attitude does, however, also have some negative effects: in particular, it has encouraged a too competitive learning culture, the view of education as a means to obtaining social status and a temptation for parents in their uncritical enthusiasm to pay too much for private tutoring so that their children can gain an advantage in the competition for university places (Kim et al., 1993).

Although Korean higher education has grown remarkably in quantity and in its contribution to the nation's development, it faced some criticisms as it approached the millennium: its under-developed international competitiveness in research and education, its failure to respond to the needs of socio-economic change, the mismatch between the supply and demand of highly educated workers in the labour market, the lack of diversity in its universities. Faced with these criticisms, the Presidential Commission on Education Reform proposed the 'Educational Reform for the 21st century' in 1995-1996 (PCER, 1997). In the document, the committee emphasized the advent of the information society, in which knowledge and information would play a critical role for the future of the nation, the part that the universities should play in developing the nation's intellectual power and research to a world-class standard, the need to introduce cutting-edge educational technology for continuing education and life-long education. From the mid-1990s, several reform policies were implemented to improve the quality of research and teaching in higher education. The main direction of government policies has changed from 'control' to

individual university ‘autonomy’ and ‘competition’. With the impact of government reform policies, the qualitative standard of education and research in Korean universities has gradually been raised.

2.5. The government’s strong initiative in adopting ICT in South Korea

The rapid development of ICT and e-learning has been driven by the strong national initiatives during Kim Dae-Jung’s government (1998-2003). The Korean government set up specific national plans to turn the country into an information society and implemented more direct intervention policies. The Ministry of Information and Communication (currently the Ministry of Knowledge Economy) established an information and communication infrastructure to change Korea into an information society, implemented a pro-market set of policies to develop ICT industries, provided ICT training for about ten million people and introduced a policy to reduce the digital divide by providing financial support for low-income people. The Ministry of Education and Human Resource Development (currently the Ministry of Education, Science and Technology) published several master plans to construct the infrastructure for ICT in schools and universities and educational resource networks in the areas of school and higher education. The Ministry of Labour (currently the Ministry of Labour and Employment) contributed to the expansion of e-learning for corporations by giving financial incentives to those companies which provided e-learning to their employees (MOKE et al., 2009). With this level of national effort and investment, South Korea has transformed itself into one of the world’s IT powerhouse nations. According to national statistics (Statistics Korea, 2010), the percentage of households in 2010 with access to the Internet in the country was 81.6% and with access to a home computer 81.8%. Regarding schools context, the number of students

per computer was 5.9 in primary schools, 6.0 in middle schools and 6.2 in high schools. The number of computers per teacher was 1.1 in primary schools, 1.3 in middle schools and 1.2 in high schools (KERIS, 2009).

2.6. The aims and strategy of e-learning in South Korea

As globalization proceeds, it has influenced the education market. Higher education and adult education market in particular have faced the pressure of opening Korean markets to foreign countries under the WTO (World Trade Organization) and FTA (Free Trade Agreement). Korea is seen as an attractive international education market, due to its people's passion for better education. So, Korean higher education was exposed to international competition. In fact, some foreign universities are attempting to establish a branch campus in Korea and there has been a boom in e-learning courses granting foreign university degrees. So, Korean universities are confronted with a need for innovation to survive and enhance their competitiveness. Under this situation the Korean government recognized e-learning in higher education as a core strategy for maximizing national competitiveness and human resource development, alleviating the educational gap between universities and regions and training the workers for strategic regional industries.

In 2004, the Ministry of Education & Human Resource Development (MEHRD) established the 'Implementation Strategy for National Human Resource Development through the promotion of e-learning', to cover school education, higher education and lifelong education. It set out the future aims and directions of government policies for using ICT in education. According to the government, e-learning is the major strategy for 1) improving and supplementing school education, 2) enhancing higher education competitiveness and nurturing key human resources, 3) providing lifelong education

opportunities for adult learners, 4) achieving social integration through e-learning provision for disadvantaged groups. The MEHRD also established a comprehensive master plan for the adoption of ICT in higher education, 'e-Campus Vision 2007' (MEHRD, 2002), covering 2003-2007. The plan included several implementation projects: 1) the expansion and enrichment of ICT use in education and research. A sub-task included the enrichment of the e-learning infrastructure, the establishment of e-learning support centres for regional universities to share, the transforming of traditional classrooms into e-classrooms, the digitization of education and research resources, standardization of research resources and a digital library; 2) the use of ICT for innovations of university administration (introducing e-administration and the expansion of online services); 3) the enhancement of ICT literacy among students, faculty and support staff in universities.

Below the adoption of e-learning in higher education is introduced: the establishment of distance universities and the policy to encourage e-learning in traditional campus-based universities.

2.7. The current state of e-learning in Higher Education in South Korea

E-learning policy in traditional campus-based universities

E-learning began to be adopted in higher education in the late 1990s. Some universities opened online classes and expanded to form inter-university consortia for the development of online learning content and exchange of university credits. The Korean government's strategy for this in campus-based universities was based on the encouraging individual universities to be autonomous but cooperative with other universities. For this purpose, the MEST established and funded 10 e-learning Resource Centres in 10 local regions. The role

of the e-learning Resource Centre is to encourage the cooperative development of the content of e-learning, the sharing of it and the sharing of e-learning facilities (studio-lecture rooms, digital editing system) among the universities in the consortium to resolve education gaps between universities and/or regions through e-learning (KERIS, 2009).

To support e-learning use, the Korean Open Course Ware (KOCW: <http://www.kocw.net>) service was begun by KERIS (Korean Education & Research Information Service) in 2007. KOCW is a service for sharing educational content for higher education, developed both in Korean and overseas universities such as MIT's open courseware, the open Yale course and similar initiatives.

E-learning in Distance Universities

There are two types of higher educational distance institutions in South Korea. One is the Korean National Open University, established in 1972. It has contributed to expanding adult learners' higher education opportunities and achieving an open learning society through distance education. It introduced Internet-based lectures in 2004 and opened all the lectures on its website (www.knou.ac.uk). It provides undergraduate courses, graduate courses and non-degree programmes. The total number of enrolled students was 272,452 as of 2010 (KEDI, 2010).

The other type of distance higher education institution is Distance Universities. In 1996, the presidential advisory committee for education reform recommended to introduce Distance universities for the purpose of providing lifelong learning opportunities through cutting-edge information technology in virtual space. Since the enactment in 2001 of the 'Law of lifelong education', Distance Universities have continued to be set up. When

students have acquired the required credits, they are granted the diploma or degree of a vocational college or university. At first, Distance Universities were conceived as a type of life-long educational institution, but with the amendment of the Law of Higher Education in 2007, the name of 'Distance University' was changed to 'Cyber University' and this allowed the Distance Universities to be transformed into another type of higher educational institution, if they were eligible. This amendment was made in order to enhance the status and quality of Distance Universities. As of 2010, 3 Distance Universities and 16 Cyber Universities have been established and the number of enrolled students is 102,206 (KEDI, 2010 Education Statistics Service).

The current state of e-learning use in Higher Education

According to the latest statistics (KERIS, 2009), most HEIs are adopting e-learning components at institutional level; however, the proportion of e-learning classes and the number of students taking e-learning classes still represent minorities.

Among the 184 HEIs which responded, 75% (138 universities or colleges) had currently adopted e-learning, 7.7% of classes (9,840 out of 127,606) were e-learning classes and 19.4% of enrolled students (303,529 out of 1,567,968) were taking e-learning classes (see table 2-1).

In campus-based universities or colleges, e-learning was used to support off-line classes. Lim et al. (2006) surveyed 201 four-year universities and 152 two-year colleges (except for 17 cyber universities) to investigate the current state of e-learning use in higher education. The response rate was 96.5% in four-year universities and 92.7% in two-year colleges. They divide e-learning classes into three types: 1) cyber-classes, when more than 70% of

the class was given online, 2) blended classes, when 30%-70% of the class was given online, 3) supporting style, when LMS or the homepage was used to support off-line classes. With regard to the three categories, most e-learning classes used LMS or home page to support off-line classes (89.66% in 4-year universities and 71.41% in 2-year colleges), as a way of posting lecture notes, information notice boards and the submission of assignment. The proportion of cyber classes and blended classes was small, representing a small percentage: cyber classes occupied 0.86% and blended classes 0.54 % in the four-year universities.

<Table 2-1> E-learning implementation in South Korean HEIs: KERIS (2009)

<i>Types of HEI</i>	<i>E-learning implementation</i> (n=184)	<i>Number of e-learning classes</i> (n=127,606)	<i>Number of students taking e-learning classes</i> (n=1,567,968)
<i>4-year university</i>	81 (82%)	5,098 (5.0%)	259,368 (20.1%)
<i>University of Education</i>	1 (33 %)	0 (0.0%)	0 (0.0%)
<i>University of Industry</i>	6 (75%)	114 (1.9%)	4,798 (5.4%)
<i>2-year college</i>	33 (58%)	245 (1.7%)	24,680 (13.9%)
<i>Cyber university</i>	17 (100%)	4,394 (99.3%)	14,683 (100.0%)
<i>Total</i>	138 (75%)	9,840 (7.7%)	303,529 (19.4%)

The instructional model adopted in developing e-learning content also duplicated that of the traditional campus-based classroom. Instructor-lecture type content predominated: 82.1% in universities, 78.9% in colleges. The most frequently used technology was the combination of VOD (Video On Demand) + text (55.6% in universities, 29.4% in colleges); next came AOD (Audio On Demand) + text in universities (15%, 14.7% in colleges). Thus, the traditional lecture style instruction model was delivered through a media combination of VOD or AOD in combination with the text (Lim et al., 1996).

Stakeholders' perception of e-learning

Lee and Lee (2007) surveyed the perception of blended e-learning among 314 instructors in a campus-based university. Most instructors perceived that the use of e-learning would be mainstream and that blended e-learning is effective for learning; they expected that they would use e-learning in the future, no matter how small their prior experience of e-learning. However, there were differences in perception between the instructors with e-learning experience and those without it. The instructors with previous e-learning experience responded that they used e-learning with the perception that 'e-learning is effective for teaching and learning' and 'can archive teaching and learning resources'; for them, the difficulties in using e-learning were 'lack of time for e-learning content development and management', 'lack of technical knowledge for e-learning', 'lack of knowledge about instructional models for e-learning'. The instructors with no previous experience of e-learning responded that they did not use it because of 'lack of knowledge about how to teach in e-learning' and 'lack of technical knowledge', 'lack of time for developing e-learning content' or the belief that 'learning content is not suitable for e-learning'. More than half of them perceived that blended learning would be more effective than classroom-

only teaching in that this allowed for ‘more varied use of teaching content and methods’, ‘more interaction opportunity with students’ and ‘more student participation in class’. However, the majority of them perceived that e-learning could not substitute for classroom teaching, and is only suitable for supporting classroom teaching. The instructors needed guidance and instruction in e-learning teaching models, ICT training for e-learning and sharing best practice in e-learning.

Lee (2006) surveys the instructor’s perceptions of e-learning in a Cyber university context. The instructors perceived that the merit of online learning is ‘overcoming time and space’ (50%) and held that the objective of the online class is ‘understanding of learning content through individualized learning’ (63%). Most instructors responded that the online class required more time and effort: ‘the amount of time spent on an online class is more than for classroom teaching’ (66.7%), saying that they spent a good deal of time in ‘responding to student questions’ (86.7%). The instructors perceived that online classes required different instructional models from classroom teaching and in particular needed special strategies for motivating adult learners to complete the online class. To improve the quality of online teaching, ‘diverse online teaching model and teaching resources’ and ‘workshops for improvement of teaching skills’ were felt to be needed.

Na and Han (2002) analyzed learner, instructor and operator’s perception of e-learning (36 learners, 22 instructors, 17 operators). The three groups perceived different barriers in adopting e-learning. The learner group listed: 1) the difficulty of allocating study time when combining work and study, 2) the difficulty of collaborative learning activities with peers in e-learning courses, 3) the greater amount of study time required for these than for traditional classes, 4) the higher cost than expected of taking an e-learning course and 5)

the difficulty of interaction with the instructor. The instructor group reported: 1) too much time and effort needed for developing e-learning content, 2) lack of expert skills for programming and graphic design, 3) too much time spent on responding to student enquiries, 4) lack of knowledge about teaching models suitable for e-learning and 5) more psychological pressure in e-learning because the instructor's role is more influential on students' learning than it is in classroom teaching. The operator group reported: 1) the difficulty of sustainable system development and maintenance, 2) the problem of budgeting and 3) communication problems between instructors, developers and operators.

2.8. Summary

In this chapter the contexts of e-learning adoption, its aims and strategies, and the current state of e-learning development and use, including the stakeholders' perceptions of these in both the UK and South Korea are presented.

The two countries have some common background in adopting e-learning: in particular in the external and internal pressures to adopt this technique, to improve the quality of teaching and learning and to provide more flexible ways of learning to a wider population which wants to upgrade its knowledge and skills in a highly competitive and rapidly changing 'knowledge society'. In campus-based universities in both countries, e-learning in higher education is widespread and accepted as a mainstream activity for tutors and students. However, contrary to early radical expectations, e-learning has not replaced traditional classroom or traditional campus-based universities. Fully online courses represent a small minority of all courses. Instead, e-learning is used as a supplement or blended with more traditional classroom teaching, which still occupies a central role, e-learning being used in an ancillary way for posting lecture notes or as an additional

communication tool. In fully online courses, the content was developed mainly by duplicating the traditional lecture-style teaching model adopted in the classroom.

Distance learning institutions have adopted e-learning components for course delivery and communication and online tools are mixed and used with other pre-existing course delivery media (such as television). This trend coincided with the OECD report (2005) on 'E-learning in tertiary education', which surveyed 19 tertiary education institutions in 13 countries. It said that the growth of e-learning has not altered the fact that face-to-face classroom teaching still remains central in most campus-based institutions. Fully online courses occupy only a small percentage (under 5% of total enrolments at most campus-based institutions) though this mode is understandably more suitable for adult learners who want to combine work, family and study than for younger undergraduate students who may have more time and other kinds of motivation to attend the classroom. The report predicts that fully online courses at campus-based institutions will remain very much in the minority in the short to medium term because universities are more interested in improving the quality of on-campus programmes by means of e-learning.

At present, e-learning has contributed to the reaching a wider learning population, for whom it was previously impossible to access higher education learning opportunities, due to time and place constraints. E-learning has not, to date, radically changed the methods of teaching and learning. This implies that e-learning is mainly based on the traditional knowledge transmission-acquisition paradigm. Innovative use of ICT requires a change to the learning and teaching culture and integrating this with system functionality: student and instructors who are willing to take new roles and develop new competencies and changes to other available support systems such as curriculum and assessment policies aligned to

these new approaches. At present, as reported in both countries, many teaching staff lack ICT skills and do not know how to embed e-learning in their teaching process. A new pedagogy which is suitable for e-learning is not yet established, except for some experimental cases. Students are struggling to adjust to the e-learning environment.

In addition, the adoption of ICT should consider two ways of forward: the integration of both top-down and bottom-up approaches. Conventionally, ICT adoption was decided centrally at the institution level or at the tutor level by enthusiastic individuals. Therefore, students' opinions were not often considered. However, students are already using a range of personally selected technologies. In some cases, institutionally provided technologies are not what students appear to use, and may not be what the students prefer to learn with. This implies that a more holistic approach (in terms of the involvement of different stakeholders) as well as a more contextualized approach (with more autonomy for the local institution) is required when designing successful e-learning. The preferred new approach (by staff) would be a blended mode. Whitelock and Jelf's (2003) three meanings for the term 'blended learning' are helpful in considering new approaches: 1) the combination of face-to-face learning with web-based online approaches, 2) the combination of diverse media and tools in an e-learning environment and 3) the combination of diverse pedagogic approaches. In the next chapter suitable pedagogic approaches and their appropriate use in blended e-learning will be considered in more detail.

CHAPTER 3

LITERATURE REVIEW

3.1. Introduction

The question of how to use ICT to enhance teaching and learning has been a consistent yet unresolved issue in research into educational technology. In the beginning, it was mainly used with the aim of improving the acquisition of knowledge by individual learners and the application of such acquired knowledge through drill and practice software. This led to the criticism that it involved low quality learning based on an educational model of knowledge transmission: because it involved no human-human interaction, it failed to develop higher order thinking skills which require scaffolded discussion. There were also problems associated with the isolation of individual learners, the difficulty of developing individualized learning content and cost-inefficiency. As an alternative or supplement to those approaches, Computer Supported Collaborative Learning emerged as a new paradigm for educational technology use in the mid 1990s. Simply defined, CSCL is the use of ICT for supporting collaborative learning. CSCL is based on newer social and constructivist learning paradigms. In the following, I explore the contexts for the rise of CSCL, including the changing educational environment, new challenges for higher education and the rise of new social and constructivist learning paradigms.

3.2. The changing environment

As the new millennium approached, there were various debates about the role of higher education and the relationship between higher education and society or the world of work.

These were intensified by social and economic environmental changes: the transition from an industrial society to a 'knowledge society', globalization, the development of information technology and computer networked society as discussed in the previous chapter.

The argument is that the knowledge society widens the definition of knowledge and accordingly changes the ways of learning. Lundvall and Johnson (1994) categorize four types of knowledge: know-what, know-why, know-how and know-who. Know-what is factual knowledge. Know-why refers to scientific knowledge of the natural world, the human mind and society. Know-how refers to the skills needed to do something. Know-who refers to information about who knows what and who knows how to do what. Traditionally, education has focused much more on know-what and know-why. A traditional formal education supplies know-what and know-why. However, know-how and know-who are rooted primarily in social and practical experience, and hence, can be learned only through action in more authentic situations including the social interaction inherent in communities of practice (Lave and Wenger, 1991).

The advances in ICT have radically changed the way that information and knowledge are produced, stored and disseminated. As the definition of knowledge has changed and expanded, the individual's status has changed from information consumer to information producer. As people gain access to a great range of sources of information through the Internet, mobile phone, PDA, orbiting satellites, cable networks, optic fibres and WiFi, the speed, quantity and quality of information are far beyond what was provided by the older information communication technologies, such as books, radios and terrestrial television. Now, the problem is how to select relevant and trustworthy items from the flood of

information and how to manipulate them to create new meaningful or contextualized knowledge. Information technologies have dramatically changed our ways of working. People can communicate, cooperate and trade with their counterparts world-wide through the Internet without travelling to any location to meet face-to-face. Therefore, the use of the Internet has contributed to the speed of trade and reduced its cost. In this networked society, ICT literacy is imperative - it has become part of basic or functional literacy for joining in society.

The other characteristic of today's working life or professional expertise is its highly social and networked nature. Experts work in collaborative teams, share their knowledge with other experts in their domain and experts from other domains and communicate multi-professional networks.

These drastic changes have raised profound doubts and questions about the role of Higher Education, the relationship between Higher Education and the world of work, the skills and knowledge needed by students and the methods of teaching these new skills (Laurillard, 2002; David and Foray, 2001). This is why Higher Educational reform has become a global theme at the end of the 20th century.

3.3. New roles for Higher Education and the required competencies in the knowledge society

Over the last few decades, many countries have expanded their investment in higher education in the expectation that it would contribute to national development and personal welfare. In the developed countries, higher education has traditionally been for the elite. However, as the population of higher education students has expanded, this population has

become increasingly diverse in its background and educational needs, raising several problems. The most critical of these are: the mismatch between learning in higher education and the required job skills in the world of work, the shortage of the competencies required, an oversupply of graduates who lack the relevant skills, ironically unable to alleviate the shortage of high-level workers, thus the under-employment of graduates, increase in unstable and insecure employment conditions, such as part-time or short-term employment (Teichler, 1999; Van Horn, 1995; Bennett, Dunne and Carre, 1999).

Faced with these problems, higher educational institutions have been forced to reconsider and change their roles and relationship with the world beyond. It is claimed that the university can no longer remain an ivory tower which pursues only intellectual goals or truth itself. The higher educational institutions are expected to produce innovative knowledge for industry and train people to form a skilled workforce (Scott, 1997). To enhance the connection, practitioners in related businesses are increasingly involved in curriculum development and part-time teaching in higher education. Students are also increasingly required to take internships in relevant workplaces.

The increasing diversity and uncertainty of the labour market favours a more generally educated workforce who can adjust flexibly to the rapidly changing work environment. Furthermore, the specific knowledge and skills learned at university are likely to soon become obsolete. This creates the need for as many as possible to have a set of generic skills as well as job-specific technical knowledge and competencies for their job (Clanchy and Ballard, 1995; Fallows and Steven, 2000).

A number of researchers and government documents list generic skills such as flexibility, entrepreneurship, creativity, problem-solving skills, critical thinking, communication and

team working skills, international competences (foreign language proficiency, understanding of other cultures), ICT literacy and the ability to become a life-long learner (Teichler, 1999; Arthur and Rousseau, 2006; Dearing Report, 1997; PCER Report, 1997). The following explores these skills in further detail.

Critical thinking, problem solving and creative thinking skills: students need to develop critical thinking or problem solving skills to define problems in complex and ill-defined domains, use the available tools and expertise for formulating the problem, searching, analyzing and interpreting relevant information, finding alternatives and choosing the best solution. Also, they need to learn to develop creative thinking to generate new ideas for solving complex problems and discovering new principles, processes and products.

Teamworking skills and communication skills: as work tasks become too complex to manage individually, workers are required to work in a team to solve them. To work effectively in a group, students need to develop communication skills, collaboration and teamworking skills.

ICT literacy and information handling skills: students need to develop the ability to search for information by using ICT, to evaluate the credibility of information and to know how to use it.

Life-long learners: students have to manage their own career paths and the continuous learning of new skills. Learning to learn and life-long learning are the key parameters of survival in this knowledge society

To develop these competencies, the predominant knowledge transmission teaching model based on lectures, books and marked assignments is limited and can be accused of failing to equip students with the full range of capacities mentioned above. Therefore, new instructional models which are based on a different learning paradigm are suggested as alternatives to or supplements for knowledge transmission models of learning. In the next section this rationale is further discussed and its evidence-base critiqued.

3.4. The rise of new learning paradigm and collaborative learning

3.4.1. From objectivist epistemology to social constructivism

Until recently, and maybe in many institutions still, the predominant educational practices have been grounded in an objectivist epistemology. Objectivist epistemology assumes that there is an objective knowledge or truth independent of the knower. Therefore, teaching is a matter of transmitting this objective knowledge to the students and learning is the acquisition of this transmitted objective knowledge. In this position, the boundary of knowledge is narrow: only an abstracted, explicit and well-refined body of knowledge is considered to be 'knowledge'. Therefore, the objective nature of knowledge inevitably separates the knowledge from the context in which it occurs and is used (Jonassen, 1996; Henderson, 1996).

In this directed learning paradigm, the typical instruction model is the lecture in which the teacher is the authoritative presenter of knowledge and assessor of student learning. The content to be learned is structured from the teacher's perspective and students are considered to accept the same learning content within the same context. Interaction may be limited to that between teacher and learner or content and learner. Instruction is grounded

largely in behaviourism and cognitive learning theory². Objectivism and the directed learning model are adopted in face-to-face classroom, computer-assisted instruction (CAI) and traditional distance learning (correspondence study, independent study).

The objectivist learning paradigm has faced much criticism in that it tends to teach static knowledge (abstract principles or why-knowledge, in the absence of authentic situations or concrete examples) which is not easily applied to the complex life of the world. Conversely, a drill and practice approach may effectively produce skilled performance but it lacks flexibility since the abstract principles (the knowing-why) have not been generated out of the experience or linked to the application context hence, the learner in this kind of training is also unable to transfer his how-to knowledge to new situations (Mandl et al., 1996). These approaches fail to prepare learners with the competencies of higher order thinking skills, team-working skills and related skills of learning-how to learn.

To cope with these changing demands and criticisms, higher educational institutions some time ago began to adopt a more social constructivist learning paradigm as an alternative or supplement. Social constructivism suggests that there is no absolute knowledge or truth but multiple representations of it; learning is not a passive reception of absolute knowledge but a learner's active and continuous knowledge constructing process through social interaction and discourse (Jonassen, 1991; Vrasidas, 2000).

² Though the transmission model rarely employs either of these theories in the ways intended by their authors but rather selectively borrows principles of structure, feedback and presentation of multimedia for transmission purposes. The need for the learner to be active, to have learning structured according to their individual learning needs and to receive immediate feedback on performance (all features of behaviourism) are often overlooked whilst cognitive theories which seek improved ways to develop the individual's higher order intellectual, creative or meta-learning skills including those of rational argument are equally, often overlooked.

Objectivism and socio-constructivism can be compared to Sfard's (1998) two metaphors of learning, the acquisition metaphor and the participation metaphor. According to her, the acquisition metaphor assumes that learning is mainly a process of acquiring desired pieces of knowledge, and therefore, the focus is on outcomes which demonstrate the recall of this knowledge and its application. The participation metaphor views learning as a process of taking part in various cultural practices and shared learning activities. Therefore, the focus is placed on activities and 'knowing' and is demonstrated not so much in outcomes or products as in the ability to reflect on them and to understand the processes which led to them.

3.4.2. Theories of social constructivism

Piaget's socio-cognitive conflict theory

According to Piaget (1985), conflict or discrepancy between two cognitive entities leads to cognitive development. When faced with peer's conflicting perspectives during social interaction, individual learners experience cognitive disequilibrium, which causes them to rethink their existing ideas. In the process of resolving the cognitive conflict, individual learners may need to change their existing schema to accommodate the new information and in this way they construct new knowledge. Here, the focus is located in the individual learner's cognition, so, the social context or social interaction acts as an important factor in facilitating the individual's knowledge construction process.

Vygotsky's socio-cultural constructivism

Socio-cultural constructivism emphasizes the socio-cultural, historical, and contextualized nature of knowledge and the importance of social interaction in the learning process.

According to Vygotsky (1978), learning occurs by experiencing two stages; first, the individual learner participates in a joint problem solving activity under the guidance or collaboration with adults or more able peers (interpersonal stage), and later this guidance is internalized and mediates learning i.e. becomes part of the individual's cognitive capacity (intrapersonal stage), therefore, the learner can solve problems by himself. Vygotsky emphasizes the role of more knowledgeable others in the learning process by developing the construct of "the zone of proximal development (ZPD)". ZPD refers to the distance between actual development level and potential development level. Actual development level refers to the level of accomplishments a child can perform independently and this is contrasted with potential development level which can be achieved with assistance or guidance from an adult or more capable peers. According to him, the contents of assistance and guidance are not the provision of ready-made knowledge or direct error correction, but highly personalized and situational guidance, intensive interaction, encouragement, probing questions to elicit responses or reflections from the students. This role of the more mature other in guiding learning is later termed "scaffolding" by Bruner et al. (1976).

Other social learning theories: communities of practice, distributed cognition

Other researchers also emphasize the social aspect of knowledge and learning. Brown, Collins and Duguid (1989) view knowledge as a product of the activity and situations in which they are produced. They see a concept is continuously under construction as a result of acting in new situations. New activities and new situations inevitably recast a concept in a new and more densely textured form. They propose cognitive apprenticeship methods which try to enculturate students into authentic practices through activity and social interaction. In this perspective, knowledge is constructed at the community level and

knowledge is distributed in the communities of practice (Wenger, 1998). Communities of practices are everywhere; at work, at school and at home. Members of communities of practice are informally bound by what they do and by what they have learned through mutual engagement in these activities. Especially, the concept of ‘community of practice’ has been applied to aid understanding the learning which takes place outside school.

Traditionally, cognitive theories have examined cognition as an individual mental process, but individuals have limited cognitive resources without external aid. Higher cognitive accomplishments use the external world and fellow inquirers as extension of individual cognition. Therefore, researchers increasingly began to note the socially distributed nature of cognition. Distributed cognition extends the boundary of cognition beyond the individual to the members of a group, resources and materials in the environment and the culture. Therefore, cognitive processes involve coordination between internal and environmental structure. In particular, the culture is a reservoir of resources for learning and problem solving, therefore, provides intellectual tools which enable us to accomplish things that we could not do without them (Huchins, 2000; Hollan, Hutchins and Kirsh, 2000).

3.5. The rise of Computer Supported Collaborative Learning

CSCL is based on a different learning paradigm (social and constructive learning) and a new way of using ICT applications for learning. Koschmann (1996) suggests four stages of instructional technology paradigm shift: the CAI paradigm, ITS (Instructional Tutoring System) paradigm, Logo-as-Latin paradigm and finally CSCL (Computer Supported Collaborative Learning). According to him, the first three of these paradigms commonly assume that learning is an individual’s psychological process, which views ICT as a

supporting tool for personalized learning, to tailor to the individual's learning needs. However, the individualized approach has limitations in practice in that identifying individual differences and translating them into a program is difficult and expensive. Learners in individualized learning environments are likely to suffer from declining motivation to learn due to isolation from others (Johnson and Johnson, 1996). As an alternative, researchers have combined ICT support with collaborative learning and this leads to CSCL.

When simply defined, CSCL is the combination of ICT applications and collaborative learning to provide an environment which supports collaboration between students in order to enhance students' learning, therefore, as Koschmann (2002, p. 18) defines it, CSCL is a field of research concerned with "practices of meaning making in the context of joint activity and the ways in which these practices are mediated through designed artifact".

Computer support for collaborative learning can take diverse forms both in face-to-face course and online distance courses. ICT can be used to mediate communication synchronously or asynchronously (this is the more frequent application), to support collaboration by providing students with points of shared reference or anchor points where the collaborating students' action and attention can be coordinated, to present or simulate a problem for study, to introduce new resources into the classroom (Koschmann, 1996; Crook, 1994).

Lipponen and Lallimo (2004) distinguish between the 'collaborative use of technology' and 'collaborative technology'. According to the authors, the collaborative use of technology refers to generic technologies which are not designed for educational use, but, can be used for collaborative learning, such as typical Internet chat or bulletin board

systems. Collaborative technology refers to specially designed tools for educational use and collaborative knowledge building.

3.6. The definition of collaborative learning, the merits and limitations

The definition of collaborative learning

There have been diverse definitions and interpretations of collaborative learning. Some researchers have used ‘collaborative learning’ and ‘cooperative learning’ as synonymous terms, in that in both students work together to achieve learning goals. However, other researchers see cooperative learning and collaborative learning as two approaches to group-based learning and try to differentiate the two terms. For them, the types of interaction when students work together should not be treated as a black box (Dillenbourg, 1999). Researchers who try to distinguish collaborative learning and cooperative learning suggest diverse criteria.

Some researchers distinguish the two terms (‘collaboration’ and ‘cooperation’) by the way in which the students work together. In cooperation, the whole task is divided into independent sub-tasks to be completed by individuals and then joined together at the last stage to produce a final output, thus limiting group members’ interaction and discussion in the working process. Collaboration is a more complex way of working together requiring more coordinated effort and mutual engagement among group members for shared meaning making (Roschelle and Teasley, 1994; Stahl, Koschmann and Suthers 2006). Therefore, the terms ‘cooperation’ and ‘collaboration’ differ in the degree of mutual engagement or interdependence among the participants in the working process and the synthetic nature of the outcome. In collaborative learning, the final product is then truly a

joint product which transcends the simple aggregation of individual pieces of work (Dillenbourg, 1999; Ingram and Hathorn, 2003). However, in many group learning situations, the actual way of working seems not to be distinctly divided into collaboration or cooperation. As Dillengourg et al. (1996) admit, some spontaneous division of work can occur in the collaboration process.

Panitz (1996) distinguish the two terms by the locus of control in the learning activities. In collaborative learning, students assume total responsibility and autonomy for their action, but, in cooperative learning, teachers maintain complete control in structuring students' interaction and assigning specific student roles to accomplish a certain end product. According to Bruffee (1999), the two terms are developed from different assumptions about the students' background, knowledge and learning motivation. Collaborative learning is typically used in higher education or adult education sector for students who have more subject knowledge and higher motivation, whereas cooperative learning is frequently used for the education of younger students who have less knowledge, internal motivation and skill for the autonomous management of their activity to create learning.

To sum up, collaborative learning is an instructional method in which the task is ill-structured, so, students have more autonomy in their group working process and the degree of coordination and mutual engagement is higher. In contrast, cooperative learning is used when students work with well-defined tasks, the tutor has more control and students divide the task and individually complete the sub-tasks, here, the degree of coordination and mutual engagement may be low.

Two components of effective collaboration

Students do not collaborate automatically, even though they are located in a group with an ill-structured task. For successful collaboration, group members should strike a balance between individual accountability and positive interdependence (Johnson and Johnson, 1996).

Individual accountability

In collaborative learning, learners should participate actively and responsibly by doing their fair share of work and helping their peers' to learn. When learners do not feel individually accountable, 'free-riding' or 'social loafing' can occur. These behaviours are likely in situations where individuals feel their contribution is not indispensable or rewarded fairly (Kerr, 1983). Free-riders cause other hard-working members to lose motivation and work less hard, because they do not want to be 'suckers' who do all the work for the others. The existence of free-riders negatively affects the overall group performance (Ruel, Bastiaans and Nauta, 2003)

Positive interdependence among members

Positive interdependence exists when members perceive that individual members cannot accomplish their goals unless they mutually coordinate each other's efforts. Positive interdependence includes a task-related aspect and a socio-emotional aspect (Janssen et al., 2007; Johnson and Johnson, 1996).

For task-related interdependence, students have to share opinions and resources, discuss and negotiate from different perspectives and be able to reach consensus. By sharing

opinions and information, students can expand the knowledge base available at group level. In the negotiation process, an individual's initial perspectives may be challenged where they are weak, or successfully defended and explained, ambiguities are clarified and elaborated to promote higher-quality decision making or shared understanding among participants. Through these processes, an individual's opinion can be grounded or justified in evidence or transformed by the knowledge of the group (Stahl, 2006).

Group members should also be interdependent in socio-affective ways. The learners' strong feeling of community is related to their engagement in the learning activities and their commitment to the group's goals (Royal and Rossi, 1993; Wellman, 1999). Group members should support and encourage each other's efforts to attain group goals, show respect for all members' opinions and interact in a trustworthy way (Johnson and Johnson, 1996). Behaviour that displays negative emotions may have a negative impact on group effort.

The merits and limitations of collaborative learning

Various benefits of collaborative learning have been reported (Gokhale, 1995; Johnson, Johnson and Stanne, 2000; Panitz, 1999).

Gokhale (1995) compares undergraduate students' achievement in collaborative learning and individual learning situation. He finds that when the task is related to critical thinking student achievement is significantly better in collaborative learning than in individual learning. However, when the task is drill-and-practice tests, student achievement does not show any significant difference.

Johnson et al. (2000) meta-analyze 158 research studies of cooperative learning and

conclude that cooperative learning produces higher achievement than competitive or individualistic learning.

Panitz (1999) summarizes the merits of collaborative learning with respect to academic, social and psychological features. Academically, collaborative learning promotes critical thinking, students' active involvement in learning processes, higher achievement and class attendance. Social benefits include promoting student-teacher interaction, skills of social interaction, responsibility, understanding of diversity and the building of leadership skills. Psychologically, it enhances self-esteem and satisfaction with the learning experience and reduces anxiety.

However, these benefits are not inherent, but depend on the way in which collaborative learning is implemented. Some negative aspects of collaborative learning have also been reported.

Salomon and Globerson (1989) summarize some common problems in collaborative learning: 1) the free rider effect, when some individuals fail to do their fair share of the work and let other group members do their work; 2) the sucker effect, when students decide to put less effort in order to avoid free riders taking advantage of them; 3) the status differential effects, when higher status members dominate group activity and become communication centres, whereas lower status students interact less with the others and have less influence on the group process.

Working in groups requires transaction costs: more time and effort are needed for scheduling and meeting as a group and, negotiating the different opinions, which do not exist in individual working (Yamane, 1996). The increased transaction cost can result in

students' discontent in collaborative group work.

Conflict among group members is also a problem. Two types of conflict, task level and relation level, are frequently described in the literature (Simon and Peterson, 2000; De Dreu and Weingart, 2003). Task related conflict occurs when group members disagree on the task itself, e.g., how to perform or how well to perform. Relationship related conflict is psychological and interpersonal. Simons and Peterson (2000) find that task related conflict is positively correlated with relational conflict. There are two perspectives on the role of conflict in group function. From one perspective conflict appears a destructive and ineffective component of group function, which should be minimized and controlled (Brown, 1983; Jehn, 1997; De Dreu and Weingart, 2003). From the other perspective, conflict is inevitable and can be beneficial to teamwork: conflict can lead to creativity or innovation (Schweiger, Sandberg, and Rechner, 1989; Janssen, Van de Vliert, and Veenstra, 1999). However, the result of conflict depends on how it is handled. Students need to learn the skills of debate to challenge each other's ideas constructively rather than challenging each other personally in ways which lead to a breakdown in relationship.

Other problems are students' frustration and resentment when they are first faced with collaborative learning (Felder and Brent, 1996), for this way of working sometimes conflicts with the individual's preference for learning alone (Ragoonaden and Bordeleau, 2000). Collaborative learning can also limit adult learners' flexible learning opportunities, because it requires the interdependence of group members to complete the task.

Learning mechanisms in collaborative learning

For learning to take place in collaborative learning, specific learning mechanism should be

employed. Dillenbourg and Schneider (1995) and Stacey (1999) suggest several learning mechanisms in collaborative learning: 1) sharing diverse perspectives and diverse resources within the group; 2) (self-) explanation: providing an explanation improves the knowledge of the speaker, as well as the hearers; 3) resolution of conflicting perspectives; 4) internalization: when people collaborate, the concepts conveyed by the interactions with more able people are progressively internalized in the listener's knowledge structure, so, they can be used in later reasoning; 5) shared cognitive load: when collaborating members spontaneously distribute the cognitive sub-tasks among individuals, they can share the cognitive burden implied by the task and each member is able to devote more resources to the task allocated to them ; 6) mutual regulation and social grounding: during collaborative problem solving, partners mutually regulate one another's activity, monitors the partner's understanding and, in cases of misunderstanding, attempt to repair the communication. Through this mechanism, both partners progressively build a shared understanding of the problem; and 7) socio-affective support and reduced isolation.

3.7. Contextual variables for effective collaboration

Researchers have tried to find the preconditions for effective collaboration, but, identifying the specific conditions for effective collaboration is not easy, because various input variables interact with each other in a complex way which cannot guarantee the creation of specific effective interaction patterns (Dillenbourg and Schneider, 1995). Although limited, several contextual variables which, it is presumed, influence effective collaboration are reviewed in the following section.

3.7.1. Group size

In general, large groups have the advantage of diversity in the idea contributed by members, but also have the disadvantages of increased overheads to coordinate group members' diverse inputs, the limited roles available for individuals in the group process and greater possibility of free-riding. Smaller groups conversely experience a lack of diverse ideas and resources, due to the lack of critical mass.

Researchers report different interaction patterns according to group size. In small groups, participants interact in a bilateral way to establish consensus among pairs of communicators. In large groups, communication becomes less interactive (Stasser and Taylor, 1991). As the group size increases, a small number of students are likely to dominate the discussion (Hare, 1981).

Therefore, researchers contend that group size should be large enough to include individuals with all the relevant skills or knowledge for effective functioning (Thelen, 1949; Johnson, Johnson and Holubec, 1994).

Although there is no consensus on optimal group size, many researchers seem to agree that the minimum is three and the maximum is five. Two- member groups are likely to lack wide-ranging ideas and various skills. In addition, when there is conflict, resolution can be more problematic.

Hare (1981) and Stahl (2006) contend that the optimum size for a small discussion group may be five. Usually in a group of five members there is enough time to explore the opinions and feelings of each member and to take these into consideration when reaching a group decision. Groups with fewer than five may experience specific group dynamics: four

members are likely to be subdivided into two pairs, three members into a pair and an odd one (Hare, 1981). Groups of more than five members are likely to suffer free-riders (Oakley et al., 2004).

3.7.2. Tutor's role

Collaborative learning and CSCL require changed tutor's roles. Collins and Berge (1996) summarize the change: 1) from lecturer to consultant, guide and resource provider; 2) from answer providers to skilled questioners; 3) from content providers to designers of learning experiences; and 4) from solitary teacher to co-learner of a learning community.

Although some researchers contend that students in collaborative learning situations should be independent of the tutor and autonomous, many researchers contend that the tutor's leadership is critical for effective CSCL. Garrison et al. (2001) argue that lower levels of the critical inquiry in online discussion occur due to lack of adequate teacher facilitation. Other researchers (Oliver and Shaw, 2003; Tagg and Dickinson, 1995) report that the tutor's enthusiasm and expertise are major factors for stimulating student active participation in asynchronous online discussion.

Berge (1995) and Anderson et al. (2001) suggest the tutor's roles in online discussion. First, online tutors design online discussions by setting the objectives of the discussion, its topics, timetable, discussion rules and norms. Second, tutors have to push forward online discussion with questions and probes to focus the discussion on critical concepts and skills and encourage students to contribute. Third, tutors retain such elements of direct instruction as confirming understanding, giving feedback, diagnosing misconceptions and injecting knowledge from diverse sources. Fourth, tutors have the social role of creating a

warm and friendly environment in order to promote students' cognitive learning processes. A weak sense of social cohesiveness can result in an increased drop-out rate for online students who feel isolated and stressed (Frankola, 2001; Rovai, 2002). Finally, online tutors need to support students' ICT skills to ensure that the students are comfortable with the adopted learning technology. Technical difficulty and the absence of personnel to provide technical support are most significant causes of students' frustration and dissatisfaction with online distance courses (Hara and Kling, 2000).

Oakley et al. (2004) suggest tutor's role for effective small group collaboration. To begin with, tutors should provide guidance on the advantages of collaborative learning, some of the problems and mistakes that new groups commonly experience and ways to avoid or deal with the problems. As the course proceeds, tutors should provide groups with a regular evaluation of the group working process. When interpersonal conflicts surface, tutors should run crisis clinics to help students.

Yamane (1996) suggests steps for successful group projects. These are: 1) composing project groups with members who have common interests and common free time; 2) allocating various roles among group members such as discussion leader, reporter, meeting coordinator and intermediary; 3) ongoing monitoring group process and encourage it by suggestion or concrete intervention.

However, their previous teaching experiences accustom tutors to traditionally defined roles and expectations. Therefore, they feel confusion or disparity between what is prescribed and what they do in practice.

Liu et al. (2005) investigate the online tutor's role perceptions and practices in online MBA courses. Online tutors show wide variation of the way in which they played or perceived their roles. The tutors put pedagogical roles, such as instruction designer, professional inspirer, feedback giver, ahead of other roles (such as managerial, social and technical roles). Time management was also identified as a factor which significantly affected their roles and caused significant tensions between different roles.

Spector (2005) compares the amount of time that the tutor invests in online courses and face-to-face courses and finds that the online course requires much more time.

With regard to the optimal degree of tutor intervention in online discussion, some researchers suggested that a moderate or balanced tutor presence is to be sought. Too dominant or too absent tutors raise problems. When tutors become the centre of attention or the authority, by presenting themselves too often, it limits students' autonomous and flexible interaction, thus making students look to the tutor for the correct answers or approval, so, leading to tutor-centred discussion (Dennen, 2005; Massolini and Maddison, 2003). Equally, when there is a lack of appropriate tutor guidance, the discussion is likely to wither and end in loss of motivation, frustration.

3.7.3. Types of task

The types of discussion topic or group task impact on the quality of the discussion or way of working.

Jeong's study (2003) finds that debate issues entailing viewpoints in conflict encourage discussion and critical thinking. Meyer (2004) and Hara et al., (1998) report that the type of initiating question is very important in determining the kind and level of response. The

type of question which asks for the sharing of personal experience elicits responses of the same kind from students and so did problem solving questions. Guldberg and Pilkington (2006) find that the discussion topics which gave students opportunity to share personal experiences often created longer monologue type contributions. When students were asked to reflect on practice more generally and less personally, then discussion was more interactive and lively debate. Students' participation was low when they had little experience in that area.

Paulus (2005) examines the impact of the type of task on collaborative versus cooperative approaches to group projects. She finds that groups overall choose to cooperate more than collaborate, but groups working on synthesising tasks engage in more collaborative dialogue than do groups working on application tasks.

3.7.4. Assessment

Using assessment seemed to have a positive effect on encouraging student participation in collaborative learning, but students' actual engagement in the discussion remains uncertain.

Oliver and Shaw (2003) find that online discussion participation is hindered when students allocate a low priority to participation and this is likely to ensue if there is no assessment.

Fung's research (2004) shows students' low participation in online discussion when participating is not mandatory.

However, it is not certain that using assessment for encouraging participation has much of a learning effect. Oliver and Shaw (2003) contend that using assessment to encourage students' participation seems superficially effective, but students are likely to participate merely for the sake of credits, without substantial commitment to discussion.

3.7.5. Student characteristics

Students' personality, learning motivation, maturity, learning style preference, previous experience of collaborative learning and familiarity with the adopted technology all appear to impact on their participation in CSCL.

Students with a shy and introvert personality or slow thinkers feel comfortable in asynchronous online discussion because they have enough time to formulate their ideas in a safe environment (Bullen, 1998; Harasim, 1990) and hence participate more actively than when the mode is face-to-face.

Students' learning preferences can impact on their participation in collaborative learning. Ragoonaden and Bordeleau (2000) find that some autonomous and highly independent students prefer to work alone and resent collaboration.

Online distance learners are likely to face problems with a lack of time, due to other commitments. Bullen (1998) finds that lack of time causes lack of motivation to take part in online discussion.

Oshima and Oshima (2002) find that students' maturity influences the quality of online discussion. In a Japanese context, they compare knowledge building discourse in CSILE (Computer Supported Intentional Learning Environment) between graduate students (as expert learners) and undergraduates (as novice learners). They find that the undergraduate students lacked domain knowledge and did not clearly identify what problems they were discussing or how they would solve them. The graduate students as expert learners clearly articulated what they wanted to discuss in constructing their discourse and were thus able to present multiple perspectives on specific questions. Oshima and Oshima suggest that the

undergraduate students need instructional interventions to improve their discourse by structuring both discourse skills and strategic knowledge.

Colbeck et al. (2000) find that students' previous in-class or out-of-class group experiences positively influence the development of their communication and planning skills in the project and students with extensive previous experiences are more likely to take the role of leader.

3.7.6. Different learning culture

Cultural difference impacts the style of communication, interpersonal behavior and ways of learning (Morse, 2003; Tweed and Lehman, 2002; Tucker, 2003; Biggs, 1996; Littlewood, 1999). Confucian-heritage learners, encompassing learners from China, Japan, Korea and Taiwan, are commonly viewed in Western educational settings as unquestioning and passive, having difficulty with self-expression, respect teachers' instruction and books as highly authoritative sources of knowledge and accept them without questioning, teacher-centred rather than self-directed or peer-directed in learning, seemingly lacking in critical analytic skills, low tolerance for ambiguity. They seek harmony, deference, courtesy, non-confrontation in classroom discussion. Students from Western culture learn more through active exploration and self-direction in academic tasks, attach greater importance to questioning and evaluating materials presented by the instructor, prefer to express personal hypothesis, see teachers as guides or facilitators in the learning process. In classroom interaction, open criticism, confrontation and public disagreement are allowed.

The growing number of international students and the undertaking of global or cross-cultural online discussion or computer supported group projects have gradually drawn

researchers' interest to cultural differences in students' engagement with e-learning tools and the problems which these create for culturally inclusive design. Some empirical research has been conducted to compare interaction patterns between students from different cultures in computer mediated communication.

Liang and McQueen (1999) compare interaction patterns among Asian and Western adult learners who joined in a Web-based interactive learning via e-mail. They find that the learners from Asian and Western cultures differed in their expectations about the tutor's role and their learning styles. Most of the Asian students tend to rely heavily on direction from their teachers even in the interactive online learning environment, while most of the Western students tend to be peer-oriented learners. Accordingly, Liang and McQueen contend that the e-mail interactive learning style is more welcomed by Western peer-oriented learners.

Kim and Bonk (2002) investigate online collaborative behaviours among preservice teachers from three different countries: the USA, Finland and South Korea. They find that Korean students showed a higher level of social interaction behaviours than Finnish and American students. They interpret the result influenced by cultural difference in communication: members of individualistic culture, such as the Americans and Finns, value independence, achievement and being unique individuals, whereas members of collectivistic cultures, such as Koreans, Chinese and Japanese, value harmony and solidarity with others. Therefore, they interpret the dominance of social interactions among Korean students demonstrates their cultural inclination toward emphasizing relationship over task. They also find language barriers in intercultural communication. In the online discussion, the Finnish students and Korean students had to participate in English. The

Finnish students posted fewer messages than the USA students and the Korean students expressed anxiety about their limited proficiency in English.

In general, asynchronous online discussion is said to provide more equal opportunities for participation. Yildiz and Bichelmeyer (2003) investigate the differences in asynchronous online discussion participation between native speakers and non-native speakers of English in an online course in the USA. They divide the participant students into three groups: ENL (English as a Native language), ESL (English as a Second Language), EFL (English as a Foreign Language) and compared the EFL and ENL/ESL groups, considering the latter two as a single group. They find that the native speakers did not dominate in the online discussion and that the EFL students could express their opinions without the constraints of pronunciation, listening comprehension, producing accurate sentences on the spot or turn taking procedures. But, they also find difference in writing style: non-native students' messages were shorter and simpler than those of the native English speaking students.

3.7.7. Technology characteristics

Computer mediated communication tools

In computer supported collaborative learning, students' collaboration is mediated by the computer applications, and the technological characteristics unavoidably influence or mediate the nature of the interaction. Some researchers compare or explore the characteristics of different types of communication media (asynchronous online discussion, synchronous online discussion, face-to-face discussion) and ICT applications.

Heckman and Annabi (2003) compare face-to-face discussion groups and asynchronous online discussion groups in Bachelor's degree course. In face-to-face discussion, the

teacher asked a question and a student responded, each utterance was tightly coupled to the previous utterance, discussion was much more 'back and forth'. Asynchronous online discussions lacked the linear, turn-taking character of the FTF discussion, however, contained more high level cognitive processes than FTF discussion. After the teacher initiated the discussions, a number of students responded, sometimes simultaneously, and often with no reference to other student responses and a number of student comments did not generate response.

Wang and Woo (2007) compares the perceived differences between face-to-face discussion and asynchronous online discussion in a post-graduate course in a Singaporean context. Students perceived online discussion to be more comfortable, less aggressive and offering more equal opportunities to voice their opinions, yet face-to-face discussion was perceived as more real and authentic because participants could talk to each other in real time, see one another's facial expressions and clarify matters immediately. Face-to-face discussion was perceived to be more efficient in reaching conclusions because online discussion normally needs longer to articulate and write ideas down. Face-to-face discussions were more prompt in response and interactive and developed in multiple ways, whereas asynchronous online discussions were tended to be more one-way. In online discussions, students were struggling to answer the discussion topics posted within the time frame, leaving less time for further interaction with peers. Students commented that they felt it was easier to express their thoughts in face-to-face discussions.

Chou (2002) compares student interaction patterns in synchronous and asynchronous online discussion in an upper-level undergraduate distance learning environment. Students collaborated on tasks in small groups with 3 members and took turns to moderate the

seminar each week. Chou analyzes online discussion transcripts with Bale's Interaction Process Analysis model, which analyzes socio-emotional versus task-related content. Overall, students mostly engaged in task-oriented discussions in both communication modes. When comparing the two modes, synchronous communication included more interactions showing socio-emotional support and exchanges of personal information than the asynchronous mode, whereas asynchronous communication involves more one-way task-oriented content.

Herring (1999) analyzes available research on cross-turn coherence in CMC. She finds that CMC has the weakness of interactional incoherence due to disruption of turn-taking and sequential coherence. Turn sequence may be disrupted when a message may be separated from the previous message it is responding to, when unrelated messages happen to intervene. When turn adjacency is disrupted, users may experience difficulty in tracking sequential exchanges, and the result may be fragmented interaction. Synchronous CMC frequently involves disrupted turn sequences. Asynchronous CMC involves overlapping exchanges which interrupt coherent sequence; multiple responses are often directed at a single initiating message or single message may respond to multiple messages. Despite the apparent shortcomings of CMC, Herring finds that reduced interactional coherence is not a serious obstacle to users' enjoyment of CMC. According to her, users may be attracted to CMC because loosely connected interaction liberates and relaxes users from the tension of coherent conversation and provides the pleasure of multiple and simultaneous interaction.

Bennett (2004) conducts a qualitative research on the role of online tools in supporting collaborative group projects with postgraduate students who were mostly part-time and lived far away from the main campus. Students were given various communication

channels, including face-to-face meetings, email, a discussion list and FTP. Students' perceptions indicated that face-to-face interaction was considered best for debating design ideas and solving problems. Asynchronous communication through e-mail and discussion lists allowed interaction to continue between face-to-face meetings and this way played a critical part in supporting teamwork. The FTP space was used as a repository for documents, allowing all team members to access the project documentation. Therefore, Bennett suggests providing various communication tools for flexible support of communication.

Nicol and MacLeod (2004) investigate how the application of two different computer technologies, groupware and shared laptops with wireless access, can be used to support group collaboration in a Civil Engineering project design class. They find that the main benefits of the shared wireless laptops was that students could sit down, face-to-face with other group members, anywhere in the department and discuss their project with easy access to project resources and this encouraged them to meet more frequently in face-to-face mode. The main benefit of the shared workspace was that it was a shared repository for project resources. Students could access and contribute to the development of shared resources from any location and could observe the progress of their project.

Wiki support for collaborative learning

In recent years, the use of Wiki, blogging or other shared working space has been explored as collaborative knowledge construction systems in the learning context. At the time of designing this project very little was known about the use of Wikis for CSCL. Ward Cunningham used the word 'Wiki', the Hawaiian word meaning 'quick', to name the collaborative tool which he developed for use on the Internet in 1994. Wikis are fully

editable websites, allowing anyone to visit, read and edit their content.

Wikis can be used for diverse purposes: for ice-breaking to help students get to know each other, class management and information distribution, collaborative writing, discussing and reviewing, collaborative projects, reflective learning journals and assessment (Augar et al., 2004; Ben-Zvi, 2007).

Research on the use of Wiki in the educational context is increasing. However, only a few empirical studies have been reported. Some exploratory research has been conducted on wiki use for collaborative writing (Rick et al, 2002; Wang et al., 2005) or students' perceptions of the use of wiki, so as to identify its merits or limitations in their eyes.

Davies (2004) reports some problems with wiki collaboration in an educational context. First, as noted above, many students seem to have a problem with the idea of the shared ownership of data within a wiki, which makes them reluctant to have their work edited by others or to interfere with other students' work in fear of offending the original writer. Second, they hesitated to release their work into the public space while it was still less than perfect, not wanting their work in progress to be subject to scrutiny and judgment. Third, new users may be required to learn a new syntax before they can use Wiki and this may present a particular problem for new users.

Raitman et al. (2005) survey students' perceptions of the advantages and disadvantages of Wiki in an Australian university. The perceived advantages were easy access, a relaxed environment, ease of viewing the work of others, fast download and facilities for signature and time stamp. The disadvantages were no alert of new message or new modification, limited HTML functions and concerns of content deletion by others.

Wiki collaboration requires users to change their perspective on the ownership of the data which it holds. Contributors should understand that their inputs into Wiki site belong to the community, not to the individual contributor, but they are still under the perception that their inputs belong to them alone.

3.8. Students' participation and interaction patterns in online discussion

To date the main focus of CSCL research has been on analyzing what is taking place in computer supported collaborative learning groups (Stahl, Koschmann and Suthers, 2006). This was enhanced by individual researchers' access to archived group working processes and products in CSCL, as opposed to in face-to-face collaboration. This research trend is natural, in that CSCL research focuses on interaction processes at group level rather than learning outcomes at the individual level. Researchers have commonly adopted content analysis methods, although coding schemes differ according to what the researcher wants to identify from the online discussion transcripts. The following are examples of research which have developed coding schemes for different analyses of content with different objectives: critical thinking (Newman et al, 1995; Bullen, 1998; Garrison et al., 2001), collaborative learning behaviours (Curtis and Lawson, 2001; Harasim, 2002; Murphy, 2004), social knowledge construction (Gunawardena et al, 1997; Kanuka and Anderson, 1998; Hmelo-Silver, 2003), social presence (Rourke et al., 1999; Richardson and Swan, 2003), teaching presence (Anderson et al., 2001), knowledge-building community (Guldberg and Pilkington, 2006).

In the following, several case studies on CSCL are presented to which review students' participation and interaction patterns. The selected case studies are mostly conducted in graduate courses, however, they have different objectives for the content analysis of online

discussion transcripts and accordingly used different coding schemes. It may be helpful to reveal the objectives sought by researchers in different online discussion transcripts, to see how and why they adopted different coding schemes, also to see students' participation and interaction patterns and how different contexts seem to influence these participation and interaction patterns.

Sloffer et al. (1999), Hara et al. (2000), Garrison, Anderson and Archer (2001) and Angeli et al. (2003) investigated students' cognitive level or their critical thinking in online discussion.

Sloffer et al. (1999) examines the use of ACT (the asynchronous conference tool designed by the authors in Indiana University) blended in normal classroom meetings in a face-to-face mode graduate-level course. Students' discussion was quite structured. The type of task was debating and the goal of debate was to support students engaging in critical thinking about complex issues. A set of readings for the debating task was assigned. Eight participant students were divided into groups "pro" and "con". The conference system has a hierarchical structure to support critical thinking processes: each proposal and counter-proposal being a top-level message and all the supporting and detracting arguments were indented below the top messages. Labels were used to designate the different elements of the enquiry, such as proposal/counter-proposal, supporting evidence/detracting evidence, supporting reasoning/detracting reasoning. The discussion had a structured time schedule. The pro-group had two days to present its arguments and the con-group had the next two days to rebut them. Then the pro-group had 36 hours to respond and the con-group had a final 36 hours to finish the debate. The instructor did not participate in the debate. The record of the debate in ACT can be used for students' assignments, so, their motivation to

participate might be high. The 8 participant students produced a total of 113 messages, so, on average 14.1 messages per student. Students' use of labels were: supporting evidence 28%, detracting evidence 12%, supporting reasoning 30%, detracting reasoning 18%, proposal 4% and counter-proposal 8%. The instructor evaluates the quality of participation as high and says that students displayed better critical thinking skills than in past sessions. The writers conclude that the successful use of ACT depends on interactions between the nature of the task (ill-structured and open-ended problems), the features of the used system (which supported meta-cognitive activities) and the users' maturity and motivation.

Hara et al. (2000) analyze five variables by adapting Henri's (1992) content analysis model; participation rates, interaction patterns, social cues, cognitive and meta-cognitive components and depth of processing. Asynchronous online discussion was used as a partial replacement for face-to-face classroom discussion in a traditional graduate level course in educational psychology. In this case, online discussion was an integral component of course activities and accounted for over 10% of the students' final grade. Student contributions were based on their required reading and had to be submitted before the regular weekly class meeting. Each student was required to take the role of "starter" and "wrapper" at least once. A "starter" initiates weekly discussion by asking questions related to the readings and a "wrapper" summarizes the discussions and points out problematic issues. They find that most students tended to post just one message per week to meet the minimum course requirement, therefore, student interactions were more serial monologues than two-way interactions. However, students' (explicit or implicit) reference to peer's messages increased as the discussion progressed. Transcript content analyses showed that their messages were lengthy (on average 300 words) and cognitively deep. In particular, the starter's question had a critical role in deciding the quality of the cognitive skills:

questions calling for inference, judgment and application elicited responses including these higher quality cognitive skills. Meta-cognitive strategies related to reflection on experience and self-awareness. However, students' discussions did not look like authentic discussion because negotiating meaning and defending or supporting perspectives were not observed.

Garrison et al. (2001) examine the quality of critical discourse in asynchronous online discussion in a graduate level course. In this course, the instructor and four students participated and posted 24 messages in a week. The instructor guided the discussion actively with questions and expert advice. They used their own developed coding scheme for content analysis, composed of four stages in the critical inquiry process: triggering event, exploration, integration and resolution. In the content analysis results, it was found that students mainly engaged in lower levels of critical discourse: triggering event 8%, exploration 42% (the highest frequency), integration 13% and resolution 4%. The writers attribute the low frequency of higher order cognitive discourse (integration and resolution) to the lack of tutor facilitation and the characteristics of the communication media. They suggest that the tutor's facilitating role is critical for guiding higher-order cognitive discourse.

In Angeli et al. (2003), the online conference was held for six weeks and partially replaced face-to-face discussions. The pre-service teacher students were required to post a teaching case which they had observed in the field, to post messages to at least four other cases and to provide plausible solutions to the case on the basis of the course readings. However, the students' contributions were not assessed and the moderator's role was limited to posting low-level questions. Students' participation was slightly above the minimum requirement and decreased overtime. The writers analyze the transcripts and find that students shared

personal experiences and opinions without grounding them in reliable sources and failed to reason with evidence related to theories or concepts thus, the writers evaluated student interactions lacked critical thinking. 49% of students' messages were unsupported advice and personal opinions and only 7% of responses were justified opinions and claims. They suggest appropriate assessment strategies and tutor training for high quality online discussion.

Pawan et al. (2003) analyze the patterns and types of collaborative interactions taking place in three online graduate-level education courses for language teachers. Two courses used a free and open discussion format with no specific structure, but one course used the starter/wrapper technique. The writers find that students' participation was uneven (from non-participation to a maximum 11 postings) and interaction patterns were often one-way serial monologues. Some discussions did stay on task and tended to explore the issues, but this did not lead to the integration or resolution of the ideas. There was no evidence of ideas being challenged. The researchers suggest that discussion structures (deadlines for the posting of initial messages, responses to others required by a certain date, the length of message) and the instructor's facilitation and leadership role may impact on the quality of the discussion.

In Fung's research (2004), the purpose was to encourage students spontaneously to form a collaborative learning group in postgraduate distance learning courses in Hong Kong. Therefore, the students had no structured tasks and participation in online communication was not mandatory. In this study, the students' participation rate was low (only 30%) and authentic discussion rarely occurred. In most cases, there was no response to a student's message and only one student responded before the conversation stopped. Fung identifies

the main reasons for low participation from the questionnaire: lack of time, students' preference for spending time on reading course material rather than discussion and lack of active participation from others. Lurking was prevalent: 87% of the students claimed that they read the messages but did not post any. Fung suggests that online discussion should be an integral part of the course design, to encourage students' active participation.

Kanuka and Anderson (1998) examine knowledge construction process in a three-week online forum among 25 managers of workplace learning centres. A moderator stimulated and guided the discussion. The analysis adopts Gunawardena, Lowe and Anderson's social knowledge construction model (1997) and finds that most of the conversation in the online forums was devoted to sharing and comparing ideas, but dissonance and inconsistencies were not actively explored. Despite the low level of knowledge construction, the participants evaluated the forum as being positively valuable to them and generally meeting their expectations of sharing ideas and networking with others. The writers interpret the high frequency of the first phase (sharing and comparing information) as stemming from the feature of asynchronous online discussion. With the low social presence, it is much easier to ignore or not to respond to other people's messages than it would be face-to-face.

Murphy's research (2004) identifies collaboration in an asynchronous online discussion. Eleven pre-service teachers enrolled in a web-based module in which asynchronous online discussion was used to promote collaborative problem solving by discussing one another's proposed solutions. Murphy developed a collaboration model in five stages; social presence, articulating individual perspectives, accommodating or reflecting the perspectives of others, co-constructing shared perspectives and meanings, building shared

goals and producing shared artefacts. Murphy finds that students engaged in the first two stages and did not reach the stage of sharing goals and producing shared artefacts. The greatest number of messages articulated individual perspectives, making no reference to anyone else's perspectives and the next most popular was social presence, such as sharing personal information. Murphy concludes that students participation in asynchronous online discussion tends to individual as opposed to group or collaborative efforts, therefore, specific measures to promote collaboration are required to counter the tendency toward individual efforts.

Sing and Khine's research (2006) was carried out in a Singaporean context. The module was delivered by integrating face-to-face and online elements. Eleven in-service teachers and their tutor participated in the online discussion. The task was to plan and implement IT-based lessons. The participants were encouraged to articulate their initial ideas and share them through a Knowledge Forum, which the facilitator played an active part. The writers analyze the transcripts by means of Gunawardena et al.'s (1997) knowledge construction model. The participant students posted on average 2.33 messages each week and could therefore be evaluated as active participants. Students' knowledge building activities were concentrated on phase 1, sharing and comparing information (60%). In phase 1, asking and answering clarification questions and suggesting ideas for improvement occurred most frequently but did not result in further negotiation. Sing and Khine interpret the causes as follows: first, detecting dissonance and building on ideas is a cognitively demanding task and it had been given to the participant students who were full-time in-service teachers constrained by time from fully engaging in the discussion. Second, criticizing each other's practices may be culturally inappropriate in Singapore, since it may be perceived as confrontational. Although the level of knowledge building does not seem

to be high, in their post-course evaluation the students expressed satisfaction with their learning experience.

Pilkington et al. (2000) analyze students' participation patterns between native British students and international students in online chat seminars. The participant students were 8 full-time international students, 11 part-time British students and 1 full-time British student on a post-graduate master's course. The chat seminars were held to discuss issues arising from the course reading papers. The online chat discussion was strongly tutor-led. Many of the part-time British students did not take part in the chat discussion, leaving the two most active participants to produce most of the home students' turns (one student was a part-time and the other was full-time). The main cause of the part-time British students' non-participation was their difficulty in accessing the chat from home, due to other commitments at the scheduled time. All the full-time international students participated and their participation level was similar to that of the British students who participated (other than the two most active participants). Many international students valued the chance to review the online discussion transcripts on the following day. The researchers suggested that a common meeting time should be considered, to encourage the participation of the part-time students.

Curtis and Lawson (2001) sought evidence of collaborative learning in online project groups. Students were required to work on collaborative projects in small groups (2-4 students) to produce a single composite group report. Online interactions for the group work were a compulsory component of the course and formed part of the assessment. Email messages and postings to the discussion board were analyzed by using Johnson and Johnson's (1996) collaborative learning model. Curtis and Lawson find substantial

evidence of collaboration but ‘challenge and explain’ cycles of interaction were lacking in the online discussion. Planning activities were prominent within group activities. Although students were encouraged to use the group discussion board, they preferred to use email owing to its familiarity and ease of use. Students also used telephones, fax, chat and face-to-face meetings for communication.

3.9. Summary

The above reviewed studies have some limitations. First, the quality of interaction is influenced by the situated local context. Therefore, student participation and interaction patterns should be understood with the context in mind. The inconsistent research results reported in the above discussion reflect different learning contexts. However, most researchers did not go further to explore why such interaction patterns were found or what contextual factors influenced them. Only a minority of researchers suggested an interpretation of the interaction pattern that they found. Moreover, they were mostly suggested from the researcher’s perspective, not from the participant students’ perspective. In the above reviewed studies, researchers suggest diverse contextual conditions which influence the quantity and quality of interaction: the nature of the task or discussion topic (Sloffer et al, 1999: Hara et al, 2000), the tutor’s facilitation (Garrison, Anderson and Archer, 2001: Pawan et al, 2003: Angeli et al, 2003), the students’ maturity and motivation (Sloffer et al, 1999), adopted technological features (Sloffer et al, 1999: Kanuka and Anderson, 1998), the inclusion of assessment strategies or deadlines in discussion structures (Angeli et al, 2003; Pawan et al, 2003), cultural influence (Sing and Khine, 2006).

Second, content analysis of online discussion transcript is a useful method for investigating the quality of interaction, but is open to criticism. Kanuka and Anderson (1998) contend, online discussion transcript analysis is based on the assumption that students' cognitive processes and knowledge construction process are observable processes. However, students may engage in cognitive activity or other learning activity as individuals without explicitly expressing and sharing them with others in the shared space and consequently online discussion transcripts may not reflect it. Students' vicarious learning through lurking (reading other's posted messages without actively posting their messages) in asynchronous online discussion is also not evidenced in this way (Guzdial and Carroll, 2002; Dennen, 2007)

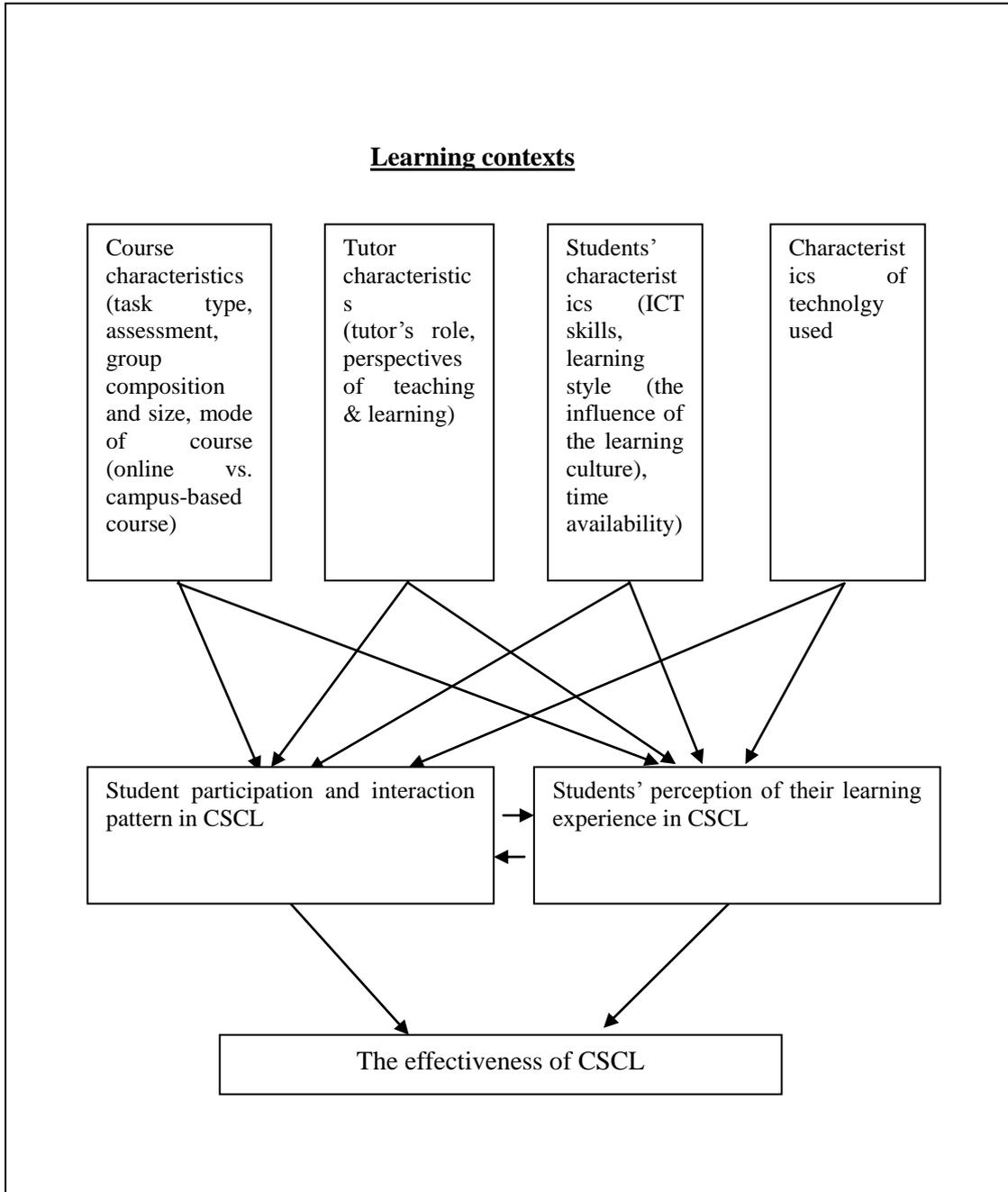
Third, content analysis of online discussion transcripts is likely to reflect the perspective of researcher rather than the participants' perspective. The integration of analysis of actual interaction process through content analysis and participant students' perception will provide a more holistic understanding of the realities of CSCL than adopting content analysis alone. Collaborative learning involves both individual learning aspects and group-based learning aspects; therefore, the analysis unit should include not only the group unit but also individual units.

My research aims to understand the effectiveness of CSCL in developing the skills and competencies required in the knowledge society and to recommend conditions for effective CSCL by adopting a holistic approach. For this purpose, I conducted four case studies to address the following research questions;

- What are the characteristics of students' participation and interaction patterns in the CSCL?
- Does CSCL benefit learning in the opinion of students? If so, what are the perceived learning benefits?
- What are the perceived merits and limitations of CSCL in the four local contexts?
- How might contextual factors affect student participation and collaboration patterns? Or how might these factors interact with each other to produce the specific features of the patterns of interactions?
- What are the potential consequences of the findings for designing CSCL, in particular, for creating the necessary conditions for effective CSCL?

Therefore, the conceptual framework for this research may be illustrated in the following Figure 1.

<Figure 1>The conceptual framework for this research



CHAPTER 4

RESEARCH METHODOLOGY

4.1. Introduction

This research carried out four case studies. Case study research typically collects evidence from multiple sources for an in-depth understanding of the phenomenon. This research collected qualitative and quantitative data from online documents (course websites), focus groups (online or off-line), questionnaires and interviews with tutors. These diverse sources of data were used both to answer different research questions and to corroborate findings more convincingly via the triangulation of data sets (Yin, 2003, pp. 97-99).

This research, which is based on the pragmatist research paradigm, uses any approaches thought to be effective for answering the research questions in the specific research context. Different methods of data collection were used according to the questions asked and the needs of each case in context. However, where possible, the design aimed to compare cases through the adoption of collection and analysis methods that were as similar as possible across cases. In the data analysis, the collected qualitative and quantitative data are triangulated to provide a more holistic picture of CSCL in practice within and between cases.

In the following, the rationale for adopting multiple case studies and mixed methods for data collection and data analysis are presented.

4.2. Why case studies?

The purpose of this research is to explore whether CSCL can be an effective instructional method for developing higher order thinking skills including communication skills and team-working skills and to suggest conditions for effective CSCL. To this end, four case studies were conducted for the in-depth investigation of student collaborative behaviours, their perceptions and the mediating variables impacting on collaborative behaviours in the four unique and natural CSCL contexts.

The student perceptions of CSCL were expected to be contingent on the quality of the actual learning processes. Learning processes are affected by diverse input variables (including the characteristics of the participating students, tutor, the technology used and course design) and the ways these variables interact in a local CSCL context (Benbunan et al., 2004). Therefore, we cannot simply ascertain whether CSCL is a useful learning environment or not, without holistic and in-depth understanding of the CSCL in practice, including the participants' perceptions, observation of the learning process and its bounded context of CSCL (Schrire, 2006).

This implies that the phenomenon and context are related to each other, indeed, hard to separate. Therefore, experimental and quasi-experimental designs which divide the phenomenon from the context and control all the contextual variables except for one or two independent variables are unrealistic if we want to fully understand the complexity of CSCL. Tolmie (2001) suggests that a more sophisticated and context-sensitive approach may be needed in research into ICT in education.

Case study research aims at a rich description of the complex dynamics of phenomena

which are located in unique and real contexts and as a result, emphasises “a phenomenon in context” (Cohen et al., 2002, p. 179). Yin (2003) similarly contends that case study research is suitable when “the boundaries between phenomenon and context are not clearly evident” (p. 13).

According to Yin (2003, p. 9), case study design is more suitable when the research questions are related to “a “how” or “why” question...about a contemporary set of events”, and when “the investigator has little or no control” over the researched events. In applying these two criteria, my research questions include how students collaborate, how they perceived their CSCL experience and why collaborative interaction patterns occurred. In addition, my personal position prefers case study research to experimental or action research because I do not work for any educational institution as a teacher or as a member of a practice group, and thus would face practical limitations in conducting experimental or action research.

4.2.1. Why multiple case studies?

Since Koschmann (1996) claimed CSCL as an emerging paradigm of educational technology use, many researchers have examined student participation and interaction patterns in CSCL. However, many of them have been reliant on the single case study method, with the result that their findings reflect the idiosyncrasies of the context, such as the tutor’s role, student characteristics or other course related characteristics. In addition, most of this type of research ends by reporting only what had happened in a given CSCL context and does not attempt to explore what contextual conditions seem to impact on certain interaction patterns, or how students’ perceptions might give insights into the merits of the instructional method in the context presented to them. It may lack the holistic

approach.

Of course, reviews of individual case study research on CSCL provide some more general clues concerning the contextual factors influencing interaction patterns (positively or negatively) and the conditions for effective and successful CSCL. Individual case studies provide richer description of the contexts than can typically be found in reports of large scale quantitative surveys or experimental research. However, case studies also have limitations for arriving at general conclusions because they are selected according to the specific research questions of the researchers or filtered and organized through the lens of the researcher's perspective.

By undertaking multiple case studies, in contrast, the researcher can obtain coarse raw data which is not selected according to another researcher's aim; this allows him or her to take more systematic control (through the data collection process) of gathering evidence on specific features in each case and comparing and contrasting cases in ways that gain greater insight into possible mechanisms. Multiple case studies enable researchers to compare and contrast the commonalities or differences in students' perceptions and collaborative interaction patterns in relation to the contextual conditions which may influence them. Therefore, conclusions arising from multiple cases would seem to be more credible in terms of generalisability – the likelihood of or potential for the transferability to other contexts than those drawn from a single case (Yin, 2003, p. 53). Moreover, this may benefit other practitioners seeking to integrate information technologies into their courses.

This research was conducted in two different types of institution, located in two different learning cultures. Nowadays, nearly all multiple case studies are conducted within a single university or within a single nation. Although the findings of these studies have been

fruitful, some institution-unique or nation-unique characteristics may influence the findings, limiting the applicability of these findings to other settings.

These days, more higher educational institutions are seeking to deliver e-learning courses to global learners and create collaborative learning environments with institutions in other countries. Therefore, Arbaugh and Hiltz (2005) contend the study of CSCL practices is needed in different national or cultural contexts and in contexts which bring students from different contexts and cultures together to study collaboratively (multinational and international contexts).

4.2.2. Selection of multiple case study sites

Walford (2001) points out the problem of research site selection in comparative case study research. He notes that many researchers select their research sites for access convenience, giving inadequate justification of the characteristics on which they choose their sites. He argues that selecting appropriate sites according to the requirements of the research questions should be a priority rather than convenience of access, even though he admits that practical compromises are often unavoidable.

For a student researcher, selecting a suitable research site was one of the hardest obstacles to overcome. At first, I planned to research two distance e-learning courses: one UK and one South Korean higher educational institution.

In South Korea, I could easily get permission from the post-graduate school for distance learning where I had taken my MA course. The problem was to get permission from a suitable counterpart in the UK. I first made contact with a prestigious distance learning institution. I selected these two courses because they had similar contexts, in that the

students on both were adult learners, the study area was e-learning and both were postgraduate courses using e-learning as a delivery mode.

However the UK institution refused to allow me to study the course. My supervisor and I contacted the course leader several times via e-mail to suggest alternative formats which might be more acceptable. However, the barrier was too high for an external researcher. It was a very frustrating experience because it jeopardised my research prospects. I then sought an alternative research site. Fortunately, and at short-notice I was given the opportunity to participate in a Wiki project being undertaken by my supervisor as a member of the research team (it became case study 3 as reported here, although chronologically it was the first study). However, it involved different types of collaboration task and a different tool for supporting collaboration - a group project task with the support of an adopted open-source wiki program together with the institution's VLE, in support of a campus-based course.

Asynchronous online discussion in a distance learning course in South Korea vs. a group project using a Wiki in a traditional campus-based university in the UK seemed not very good match, although they had some common traits, in that both of them were types of computer supported collaborative learning in higher education.

I thought a more balanced case selection was needed. I made contact again with the Korean professor who had given me permission to research and asked if I could get access to another module which had an online group project task. In addition, my supervisor allowed me to study her module, which incorporated asynchronous online discussion. Finally, I arrived at four case study sites which had some common traits, in that they either adopted group discussion or a group project as a component of course design. Moreover, they were

all post-graduate courses and used information technology to support collaborative learning, and so, could all be said to fit the definition of the term CSCL. However, they differed on participant and cultural characteristics at group, course and institutional level as described in the introduction.

First, the cases are located in different socio-cultural contexts: two in the UK and two in South Korea. As globalization proceeds, the UK universities are recruiting many international students. In particular, the UK university is famous for the large proportion of international students enrolled there. In case study 1, among the 12 enrolled students, there were only 3 native UK students; the other 9 were international students. This case thus gives some insight, not so much into UK student culture (unlike case 3), but rather into student perceptions and behaviours in a multi-cultural course setting in the UK.

Second, the two higher educational institutions in which each of the two case studies were conducted are different in their course delivery mode: the Korean higher educational institution is a special graduate school for distance learning, with the main delivery mode online whereas the UK institution is a campus-based university which incorporates IT tools including VLE (WebCT) and a Wiki as teaching and learning aids.

Third, each case is located at a different local course level: they differ in tutor roles, student characteristics, course designs (the features of the task, assessment policy) and the technologies supporting collaboration (asynchronous online discussion, wiki, synchronous online discussion). The differences in context in the four cases are shown in the table 4.1. More detailed information about contexts is shown in the Appendix (1). As these are natural cases these variables could not be controlled but by exploring within and across cases it is hoped some insights into how they operate can be gained.

<Table 4.1> The four cases and their characteristics

	<i>Cases</i>			
<i>Characteristics</i>	<i>Case 1</i>	<i>Case 2</i>	<i>Case 3</i>	<i>Case 4</i>
<i>Country and language of teaching and participants</i>	UK-English Mainly international students for who English is a second language	South Korea-South Korean students communicating in their native language	UK- English students communicating in their native language	South Korea-South Korean students communicating in their native language
<i>Level and Types of Institution</i>	Postgraduate University	Postgraduate University	Postgraduate University	Postgraduate University
<i>Course Mode</i>	Campus with blended online activity between classes	Online distance course	Campus with placement and blended online activity between classes	Online distance course
<i>Collaborative activity</i>	Discussion-seminar based on set reading	Discussion-seminar based on course materials	Group design project	Group research project
<i>Supporting technology</i>	Asynchronous bulletin board	Asynchronous bulletin board	Wiki	Synchronous chat discussion

4.3. Mixed methodology

Case study research typically collects data from multiple sources for in-depth understanding of the researched phenomena. In this research, qualitative and quantitative data were collected from diverse sources; course websites, focus group discussions, questionnaires, observations and tutor interviews. According to Yin (2003, pp. 91-93), case

study research can include quantitative data, as well as qualitative data. The qualitative data and quantitative data were analyzed separately and triangulated.

4.3.1. The overview of mixed methodology

Tashakkori and Teddie (1998, pp. 14-19) argue that social and behavioural science research has evolved from being mono-method to mixed methods and finally to studies with mixed models. Mono-method research is subdivided into purely quantitative and purely qualitative forms of research which are conducted by the researchers who adhere to one of the predominant paradigms (positivism vs. constructivism). Mixed methods research combines the qualitative and quantitative approaches in the data collection and data analysis of single or multi-phased research. Mixed model studies expand the qualitative and quantitative approaches into several stages of the research process (including the design of the research, the formation of its research questions and the interpretation of the data), as well as the stages of data collection and analysis (p. 16).

Many researchers consider pragmatism the appropriate paradigm for justifying the use of mixed methods research (Cresswell and Clark, 2007, pp. 26-27; Tashakkori and Teddie, 1998, pp.11-13). Pragmatism rejects the incompatibility thesis and embraces both positivism and constructivism flexibly. Pragmatists believe that the choice of data collection method should reflect what works in addressing the research question and hence place priority on deciding the questions to be studied rather than the philosophical position to adopt. They admit that values play a critical role in conducting research and researchers choose the explanation which is closest to their own values amongst the multitude of possible explanations. They also accept that researchers can choose inductive or deductive logic in the research design, depending on the stage of research or its developmental phase.

With regard to the types of mixed methods research, Cresswell and Clark (2008, pp. 62-79) classify four major mixed methods designs: triangulation design, embedded design, explanatory design and exploratory design.

In this research, the triangulation design model was used in the collection and analysis of the data. The triangulation design is the most common approach in mixed methods research and its purpose is to obtain different but complementary data on the same topic to gain fuller answers to the research questions. Triangulation design research generally collects and analyzes quantitative and qualitative data separately and brings the two datasets together to converge on an interpretation by comparing and contrasting them, or using qualitative data to validate and expand upon the picture presented by quantitative data. The central advantage of this design is that it can provide a more complete picture by bringing together trends and generalizations from quantitative data with an in-depth and detailed understanding from qualitative data (Cresswell and Clark, 2008, p. 47).

However, it has some challenges for researchers. First, the two data sets may not agree with each other. Second, quantitative data and qualitative data can be collected from different sample sizes because of different purposes (generalization vs. in-depth description), so the consequence of having different sample sizes should be considered when bringing the two data sets together to converge in a meaningful way (Cresswell and Clark, 2007, pp. 66-67).

4.3.2. The rationale for adopting mixed methods research

The adoption of mixed method research was encouraged by the requirements of the research questions and my own practical considerations.

My research aimed to explore the effectiveness of CSCL through gaining a holistic understanding of CSCL in various unique contexts and by answering the following questions: How do students collaborate in the CSCL process? What are students' perceptions of their experience of the CSCL process? What contextual conditions seem to impact on effective collaboration in the four CSCL situations?

In traditional face-to-face collaborative learning, obtaining data on the student collaboration process is limited by the methods of recording and access to the spaces in which collaboration occurs. However, in computer supported collaboration, researchers can acquire more detailed data on students' collaboration process through the archived data in the computer tools, such as online discussion transcripts or the constructed artifacts of the collaborating students. Therefore, a number of researchers in CSCL have analyzed online discussion transcripts or constructed artifacts to obtain evidence of the characteristics of the group collaboration process. A common approach has been to apply the content analysis method.

Although this approach has contributed to the understanding of CSCL, it has some limitations in providing a holistic understanding of what is taking place in CSCL. First, learning generally accompanies both a social learning aspect and an individual learning aspect (Salomon and Perkins, 1998). In other words, not all learning that takes place in collaborative learning contexts is necessarily as a result of or embedded in a collaborative process. However, most research has leaned toward studying the social aspects of learning. For a holistic understanding of what is involved in CSCL, it is necessary to consider what is occurring for the individual or at the level of the individual within the context. Second, the archived data might not be a complete reflection of participant students' cognitive

processes (Hara et al., 2000; Kanuka and Anderson, 1998). In order to post a message in asynchronous online discussion, a range of individual learning processes are needed: searching for related resources, self-study, organizing ideas, editing and refining the message and then posting. Posted messages therefore reflect only part of the individual's learning processes. Some researchers mention vicarious learning in CSCL (Guzdial and Carroll, 2002; Fung, 2004; Dennen, 2008). Students who do not post messages themselves can read other students' posted messages and observe their discussion processes. Therefore, they may carry out cognitive processes at an individual level, although not explicitly articulated in the shared space. However, these cognitive processes are not visible to the researcher or to the tutor. Therefore, the participant students' perspective should be considered when evaluating the effectiveness of CSCL, as well as their externalized cognitive behaviours (e.g. the messages posted in online discussion). The content analysis method may also reflect the analyst's interpretation of such interaction more than the participant's perspective. Therefore, additional methods (such as interviews or questionnaires which collect the views of participants) can complement content analysis.

A number of research studies report only what has happened in a specific CSCL environment and do not go further to suggest why such collaboration patterns happened. The features of the collaboration process need to be understood by considering the specific and unique context in which collaboration occurred. In order to help design more effective CSCL environments, the underlying mechanisms should be explored, although the feasibility of doing this may be limited, due to the complexity of the variables.

Therefore, in order to answer my research questions and to corroborate the findings more convincingly, varied sources of qualitative and quantitative data were sought (see table 4.2).

<Table 4.2> Research questions and qualitative and quantitative data collection

<i>Research questions</i>	<i>Case</i>	<i>Qualitative data</i>	<i>Quantitative data</i>
<i>Students' collaboration behaviours</i>	Case 1	Asynchronous online discussion transcripts, virtual observation	Questionnaire
	Case 2	Asynchronous online discussion transcripts, virtual observation	Questionnaire
	Case 3	Questionnaires (open-ended questions), 4 face-to-face observations and virtual observation of Wiki sites	Questionnaires
	Case 4	Transcript of online chat discussion	Questionnaires
<i>Student perceptions</i>	Case 1	Asynchronous online focus group	Questionnaires
	Case 2	Synchronous online focus groups	Questionnaires
	Case 3	(mini) face-to-face focus groups	Questionnaires
	Case 4	Group reflection diary	Questionnaires
<i>Influencing factors for CSCL</i>	Case 1	Course website, tutor interview, asynchronous online focus group	Questionnaires
	Case 2	Course website, tutor interview, synchronous online focus groups	Questionnaires
	Case 3	Focus groups, tutor interview, module related documents	Questionnaires
	Case 4	Course website, group reflection diary, tutor interview	Questionnaires

As seen in the above table, my research was a mixed research design in that each case used different data collection methods to answer the same questions according to the pragmatic constraints of the different research contexts. More detailed explanations for these choices are to be found in the following section, on data collection methods.

4.4. Data collection methods

In this research, a range of qualitative and quantitative data was collected. In this section, the rationale for adopting specific data collection methods is presented. Further details of the data collection process are presented in each of the case study chapters.

Data about students' perceptions: focus groups and questionnaires

Quantitative and qualitative data about students' perceptions were collected from the combination of questionnaires and various types of focus groups: an asynchronous online focus group in case study 1, synchronous online focus group in case study 2 and (mini) face-to-face focus group in case study 3. Questionnaires were used in all four cases.

In general, questionnaires can cover more diverse topics than can focus groups (Robson, 2002, p. 285). Although students' responses to the standardized statements on questionnaires have limitations when it comes to revealing personalized and contextualized perceptions, questionnaires can provide more general and summative information about general trends or the prevalence of certain attitudes to various issues in CSCL. Qualitative data from focus groups or open-ended questions in the questionnaire will provide more detailed and personalized views or the 'voice' of students' in their own words. Therefore, the combination of questionnaires and focus groups has the merit of offering a combination of breadth and depth in the data gathered.

Another reason for mixing questionnaires and focus groups in the collection of students' perceptions was to allow the comparison of some aspects across the four cases. To compare the similarities and differences in students' perceptions in different cases, quantitative data from the questionnaires seemed a more suitable technique than text-based qualitative data alone, since it offered the opportunity to collect some data in a standard and systematic way from all the participating students. Of course, qualitative data can be compared across cases, for example, by looking for the prevalence of similar themes or content categories. However, the number of students in each focus group was small; moreover, there is the consideration that only a few students in these focus groups might respond. Thus, there is the danger that themes are not representative of the whole group or that the discussion misses important themes.

4.4.1. (Online) Focus groups

Qualitative data about student perceptions of experience with CSCL were collected from various types of focus group. The development of information technology provided the opportunity to use it for research in the data collection and data analysis. These days, the use of online focus groups instead of traditional face-to-face focus groups has been tried. Researchers have reported the merits and limitations of online focus groups compared to traditional focus groups (Kenny, 2005; Franklin and Lowry, 2001; Walston and Lissitz, 2000).

The merits of online focus groups

1) Accuracy and efficiency in data collection

The transcripts from face-to-face focus groups are likely to have data flaws because of

inaudible voices and these can influence the validity of the research negatively. In online focus groups, participants type their opinions directly into the computer medium, so that the data are automatically saved, obviating the need for a separate transcribing process. As well as saving the time and effort of transcription, there is no danger that data will be lost in the process of transcription (Franklin and Lowry, 2001).

2) Convenience and cost effectiveness for running focus groups

When the participants are scattered over many locations and have busy schedules, traditional focus groups are difficult to manage. However, online focus groups, regarding time and place, are more convenient for participants and researchers to take part in, above all, when asynchronous online focus groups are used. Those involved, need not travel to the place or coordinate their work schedules to participate in the discussion (Kenny, 2004).

3) More equal participation than face-to-face focus groups

One of the weaknesses of face-to-face focus group is biased data collection when some people dominate the discussion (Robson, 2002, p. 285). This can affect the credibility and transferability of the findings. However, online focus groups show less of this tendency because participation is more equal. Walston and Lissitz (2000) compare face-to-face focus groups with online focus groups and find more equal participation in the latter due to lack of visible power information (tone of voice, dress and non-verbal behaviours).

4) Ease of dealing with sensitive topics

When the discussion topics are very sensitive, it can be difficult to disclose one's own honest and frank opinion in the presence of others. However, members of online focus

groups can log on pseudonymously, to allow expression without anxiety. This trait can improve the validity of the collected data (although there may be some trade-off, since anonymity can also encourage some people to feel safe in exaggerating or being less than truthful).

The limitations of online focus groups

Franklin and Lowry (2001) conducted synchronous / same place online focus groups. According to them, the limitations of online focus groups are: 1) collected data are mainly incomplete sentences and phrases; therefore, outcomes can look like a list of ideas rather than well developed thoughts on the topics; 2) participants' lack of knowledge of the computer systems can cause problems in participating in group discussions; 3) participants who can type faster are likely to dominate the discussion in synchronous online focus groups; 4) when groups are small and participants know each other well, anonymity is less likely.

4.4.2. Justifying the online focus groups in the study

4.4.2.1. Asynchronous online focus group in case study 1

In case study 1, an asynchronous online focus group was used for collecting qualitative data on students' perceptions of several issues. The choice of such group rather than a face-to-face focus group was made on the following merits.

1) Students' multi-national background: nine students (out of 12 enrolled) were international students from various countries. In general, international students as foreign language users of English are likely to participate passively in face-to-face discussion, due

to their lack of skills in English (though this would clearly depend on the individual's English proficiency). This would make face-to-face mode discussion likely to be dominated by fluent native students. This can affect the balance of representation of the collected data between native students and international students.

When using asynchronous online focus groups, international students can take time to compose their ideas in English with less concern about making mistakes in English usage. Practical considerations also influenced me in choosing this method. As an international student, I also had concerns over managing face-to-face focus groups in English. Considering the moderator's critical role in managing focus groups effectively, I thought that an asynchronous online focus group was a better choice than a synchronous online focus group or a face-to-face focus group in this context.

2) Students' familiarity with asynchronous online discussion tools: a participant's lack of computer literacy or failure of reliable computer system can cause crucial problems in managing online focus groups (Franklin and Lowry, 2001). However, the participants were accustomed to the asynchronous online discussion tool which was embedded in WebCT because they had already experienced asynchronous online discussion three times in the module. In addition, this tool when embedded in WebCT provided students with reliable access, so, students could participate in the asynchronous online focus group discussion comfortably.

3) One of the concerns in focus groups is the objectivity of the collected data when the researcher acts as the moderator of the focus group (Krueger and Casey, 2000), because the moderator's attitude or perception can influence the direction of the focus group discussion. However, the moderator's influence could be reduced in this context because the

moderator and participants were separated in time and space and only one sort of communication possible was text-only. This could be an advantage for securing a balance between structured and unstructured discourse with all students receiving the same input from the researcher yet still offering relative freedom for the discussion to take different directions according to the responses of students.

4.4.2.2. Synchronous online focus groups in case study 2

In case study 2, synchronous online focus groups were used. The module assignment included writing a group reflection diary using synchronous online discussion, which counted for 10% of the final grade. With the permission of the module tutor, I was able to use the assignment as a tool for collecting research data changing the discussion topics. Considering the participant students' situation, synchronous online focus groups seemed to have several merits. First of all, the students were online adult distance learners, dispersed in location and with busy schedules. Moreover, they were studying e-learning and were active and eager to learn and use the new ICT tools, even though not all of them were young. Last, they already had prior experience of synchronous online discussion when they carried out a small group project in the module.

My own personal situation was also a factor in choosing online focus groups. At the time, I was in the UK, and planned to visit South Korea for the final face-to-face session in order to distribute questionnaires in two of the cases (the research site for case 2 and case 4 was South Korea). The details of the topics and procedures used for the synchronous online focus groups are presented in Chapter 6.

4.4.2.3. (Mini focus) group discussion in case study 3

Case study 3 was the second phase of the project for ‘Evaluating Collaborative and Constructive Learning with Wikis’, in which I participated as a member of the research team. The Microsoft funded project was composed of two phases of research: I took part in the first phase as a student and in the second phase as a member of the research team. Therefore, I participated in the data collection and data analysis processes in phase 2. The data collection in the second phase of the research was carried out by a research group and my own role in these processes is described more fully here and in Chapter 8. However, in all cases where data are reported in this thesis, the analysis and interpretation are my own.

A short face-to-face focus group discussion was arranged. The module tutor allowed our research team 30 minutes to collect data in a classroom session after students had completed their group project work. During this time, we had to conduct questionnaires and a focus group discussion. The first 15 minutes was used to administer the post-questionnaires and the following 15 minutes for group discussion. To collect qualitative data as effectively as possible, group discussion was held in two-phases: the small group level and the whole class level. The first 10 minutes were used for small group discussions and 5 minutes for plenary whole class discussion. This order was determined because discussion in a small group would help elicit its views before they could be influenced by the views of the whole class. A respondent for each group reported its views in the plenary before opening the wider class discussion.

I was present throughout the focus group helping to administer the questionnaire and small group papers and manage the group work. One of the other researchers facilitated the whole class discussion but I had access to the flip charts and individual small-group

discussion reports following the session.

4.4.2.4. Group reflection diary in case study 4

In case study 4, qualitative data on students' perceptions were collected from one of the assignments: a group reflection diary which required each group to reflect on its group project experience. With the help of the module tutor, the researcher could change the discussion topics according to my research purpose. Each group met face-to-face and discussed its group working experiences. They summarized their discussion results and submitted them as a final assignment.

4.4.3. Questionnaires

Two kinds of questionnaire were developed: one for the asynchronous online discussion cases and the other for the computer supported group project cases. The questionnaires used in the UK were translated into Korean for the South Korean cases.

The questionnaires were composed mainly of closed-ended questions with a few open-ended questions. Closed-ended questions covered a range of issues of collaborative learning. The quantitative data from closed-ended questions were useful for comparing students' perceptions on similar questions in different contexts. From the open-ended questions, it was possible to gather from a student perspective any emerging or not envisaged issues concerning the merits and limitations of CSCL in the particular contexts.

However, in case study 3, the questionnaires had also to be used as the main method for gaining insight into the student's collaboration process. This was influenced by the research situation in this case study. There were 6 small groups dispersed in the 6

fieldwork schools and group collaboration occurred mainly in face-to-face meetings (this is in contrast to the other 3 cases, in which online collaboration was the main if not the only method of collaboration). Moreover, the group project work could take 3 weeks only. Before the project it had not been envisaged that the schedule would be so tight (offering some additional opportunity to observe collaboration among students attending classes on campus). It was also originally envisaged that students would make more use of the online facilities for the collaboration process itself, making online records an important source of data. However, the collection of rich data through observation was limited (although four scheduled observations took place, direct observation of the collaboration process was possible only in the second observation); therefore, the open-ended questions in the questionnaires were used to gather additional insights into the collaborative processes. Of course, discrepancies are possible between what students self-report in questionnaires and what they do in practice. To compensate for this weakness, data from observation and wiki use were used where possible in triangulation.

The questionnaires commonly used a 4- point Likert scale for the closed questions. The purpose of a rating scale is to allow respondents to express both the direction and strength of their opinions about a topic. The response options were as follows: 1= strongly agree, 2= agree, 3= disagree, 4= strongly disagree. I decided against providing a neutral answer between the 'agree' and 'disagree' categories, because I wanted students to take a definite rather than a neutral or 'don't know' stance on the statements. Because of the small sample size, too many neutral or 'don't know' responses can limit meaningful data collection. The draft questionnaire for asynchronous online discussion or the computer supported group project was pre-tested informally by the supervisor (in case 1) or by the research team (in case 3). The style, arrangement and wording of the questions were checked and several

unclear and ambiguous expressions were corrected to eliminate misunderstanding. Because of the small group sample size in each case (case 1= 12, case 2=20, case 3= 35, case 4=6), pilot tests were not conducted.

The statements in the questionnaires, the procedure of questionnaire administration and the response rate are presented sequentially in the corresponding chapters (Chapters 5, 6, 8).

4.4.4. Observation

Virtual observation (cases 1 and 2) and face-to-face observation (case 3) were used to collect data on students' collaboration processes, in combination with other methods of data collection. My observation as a researcher was permitted by the participating students through an informed consent form. Observation eliminates the need to ask participants about their behaviours and reduces the gap between 'what they say and what they actually do'. However, it has limitations in that observers can affect the situation under observation when the participants are aware of being observed (Tashakkori and Teddlie, 1998, p. 107; Robson, 2002, p. 311).

In the asynchronous online discussion in cases 1 and 2, student interaction occurred in virtual space, letting me observe students' participation and interaction processes virtually, without any intrusion. During the observation, I took notes of the atmosphere or impressions of the online discussion.

In case study 1 (asynchronous online discussion in the UK), I participated in the online discussion as an online discussion facilitator, making my role that of a participant observer. My presence was clear to the participating students from the outset. The module tutor introduced me to them, describing my research purpose and my role as an online

discussion facilitator. My participation may have made students more conscious of their behaviour as the subjects of research. However, some commonalities in background between the participant students and me seemed to help us all to minimize this (Robson, 2002, p. 317). The student group had an international background: 9 out of 12 students were international students. I was an international research-programme student, not an expert researcher. These similar backgrounds seemed to have a positive influence on their accepting me as a peer rather than as a researcher. If the participants had been mainly native British students, my acceptance could have been negatively influenced.

Moreover, I was in a position where I could influence the situation under study. As an online discussion facilitator, I had to facilitate students' active participation and raise the quality of the discussion. When student participation was low, I was very anxious because I thought their passivity and low-quality discussion seemed to reflect my lack of discussion facilitating skills. Moreover, students' passive participation endangers rich data collection. I further described how I tried to overcome the influence of the researcher on the collected data in the related section of Chapter 5.

In case study 3, face-to-face observations were used for collecting data related to students' collaboration processes, but the research team could observe each team for only a short time. Spending longer on observing the collaboration process of one or two groups was considered. However, there were logistical problems with this, including the extended presence of the researcher might affect the collaboration process. The existence of an outsider as researcher (especially an international student researcher in a native UK participant group) might impede the group's natural collaboration process. Therefore, other supplementary methods of data collection were used (open-question questionnaires).

4.4.5. Interviews with module tutors

Interviews with tutors were conducted using a common semi-structured interview schedule for all four cases. There was a set of guiding questions, but the interview schedules were occasionally adapted and modified during the interview process to allow relevant ideas to emerge. The interview schedule asked the purpose of adopting ICT tools in their module, the tutor's evaluation of students' participation and collaboration, any practical problems or barriers to e-learning adoption, the advantages or disadvantages of the adopted collaboration tool and the tutor's role in supporting collaboration.

4.4.6. Documentation

The module website for each case provided a wealth of documentation including: course related information and resources: student postings to the discussion boards: module's stated aims and assessment policy: assignments: lecture notes and other learning activities. These documents were downloaded from the module websites and kept for reference after each module ended.

4.5. Data analysis

4.5.1. Two-stage data analysis

Data analysis in the multiple case studies involved a two-stage process, initially focusing on each of the four cases separately to gain an in-depth understanding of the peculiarities of the case within the specific context and then analysing and synthesising cases by comparing and contrasting them to find common traits (Yin, 2003, pp. 133-134). The cross-case synthesis was conducted in two stages. First, the two cases which adopted a

similar group task (asynchronous online discussion in cases 1 and 2, computer supported group project in cases 3 and 4) were compared; later, the four cases were contrasted to bring out the differences that might be due to the task or to cultural or contextual differences.

The four cases differed on many local contextual variables, as mentioned previously. In addition, the detailed research questions contained some unavoidable differences (in line with the technology used and the nature of the group task) and there were unavoidable differences in the richness of the collected data, case by case, due to practical constraints. For example, in case study 1 the students' participation in the asynchronous online focus group was voluntary, whereas in case study 2 it was a component of the assignment for the synchronous online focus groups. Therefore, it was predictable that students in case study 2 would participate more keenly than in case study 1, producing richer data. The collected data in case studies 3 and 4 had similar problems. Therefore, I began to question how feasible it was to try to compare the four case studies, even though doing so was supposed to be one of the chief benefits of multiple case studies.

4.5.2. The triangulation of qualitative data and quantitative data

As mentioned above, my research adopted a triangulation design model for data collection and data analysis. The quantitative and qualitative data were analyzed separately. Quantitative data from the closed questions in the questionnaires were coded and entered using Microsoft Excel to enable the aggregate frequencies to be calculated. All the qualitative data in answering a particular question (from open-ended questions and from online focus groups) were copied to a new folder and any real names replaced with a code identifier for each participant. Similar responses were assembled, key words and phrases

highlighted and these were used to begin to suggest themes. Later, numerical and narrative data were triangulated to find the extent of agreement or disagreement; or sometimes the qualitative data were used to provide an interpretive context for the quantitative data e.g. using a quotation of personal opinions from the respondent's own words to illustrate, or at other times the qualitative account was enhanced by supportive quantitative data.

4.5.3. Analysis of students' collaborative behaviours

To compare and contrast collaborative interaction patterns in the four cases, using a unified data analysis method is ideal. However, it was difficult in this research because the four cases had different collaborative tasks (online group discussion in cases 1 and 2, group project in cases 3 and 4), different kinds of data and different data richness.

The difference in task type involves different interaction processes. In ideal group discussion, students share personal ideas or information on the topic, agree or disagree with each other's ideas, negotiate meaning through clarification, elaboration and explanation when there is misunderstanding or ambiguity. Through these processes, participants' multiple perspectives are converged or a new understanding emerges (Kneser et al., 2001; Harasim, 2002; Murphy, 2004; Stahl, 2006). In an ideal group project, group members share ideas and information, negotiate different ideas to reach consensus on task plans, divide the whole task among members for individual working, coordinate individual working processes for joint working and lastly produce a joint outcome. The two tasks commonly require group members' sharing ideas and information, negotiation or coordination process and synthesis of ideas or sub-tasks for successful collaboration. However, the extent of member negotiation or coordination process and synthetic nature of outcome may differ. In general, group project tasks require more member interdependence

than group discussion, especially when the discussion topics do not require any group solution or a conclusion. If this is the case, there may be little negotiation.

For analysis of students' collaborative interaction in asynchronous online discussion in cases 1 and 2, a content analysis scheme was developed. Detailed coding scheme development is presented in the following section.

Students' collaborative interactions in the group project task in case study 3 and 4 were described by using diverse sources of data. Because of different data sources and different data richness in both cases, consistent description of collaborative behaviours was limited. However, I tried to describe critical components of collaboration like individual accountability, task-related member interdependence (such as negotiation process to reach consensus and coordination of individual task to form a joint product, the extent of the synthetic nature of the group outcome) and socio-affective member interdependence (Janssen et al, 2006; Johnson and Johnson, 1996). Using this approach it was possible to extend the analysis of asynchronous online discussion and student perceptions of it to investigate if key themes and collaboration patterns were also occurring in group project tasks.

4.5.4. Content analysis coding scheme development

In asynchronous online discussion research, many researchers have developed different coding schemes to analyze the quality of online discussion. They differed in the purpose of analysis, unit of analysis, process of development (whether they were theory driven or data driven), whether the approach was quantitative (presenting frequency counts of coded themes) or qualitative (presenting raw data as exemplars of themes or issues in the words

of the participants). Therefore, there has been no commonly accepted standard content analysis method for online discussion transcripts (De Wever et al., 2005)

Some researchers have analyzed online discussion transcripts through the lens of collaborative learning perspective. However, they also have developed different coding schemes reflecting their local contexts (Curtis and Lawson, 2001; Harasim, 2002; Spada et al., 2005). So, some context-specific characteristics limit the simple adoption or replication of their content analysis coding schemes. Meyer (2004) analyzed the transcripts of online discussion using four different coding schemes to explore whether the coding scheme used affects the conclusions drawn. She find that each coding scheme focuses on particular aspects, so, suggests using different coding schemes according to the research purpose or learning context.

In this research, the content analysis coding scheme was developed by integrating both a theory-driven approach and a data-driven approach. By mixing the two approaches, the coding schemes could be built on robust theoretical base whilst also making contextualized data analysis possible.

As theoretical frameworks, Harasim's (2002) conceptual change model and Pilkington's Discount scheme served as basis for the development of the coding scheme. Harasim's model was developed for 'collaborative learning' in free-style discussion aimed at understanding a topic using an 'asynchronous online discourse' environment, therefore, it seems to be a good fit for the learning context in the case 1 and 2. Harasim's (2002) paper has fewer indicators and examples for idea linking and idea convergence and some indicators are ambiguous to distinguish. It is in this area in particular where the work of Kneser et al. (2001) and Pilkington's DISCOUNT scheme (1999) are helpful in suggesting

qualitative indicators and examples of engagement in each stage.

Harasim (2002) views collaboration as a conceptual change process through participants' idea generating, idea linking and idea convergence processes. In the first idea generation stage, participants contribute their ideas and opinions on the topic to the shared space. Both quantity and quality of messages are potential indicators of idea generation. Active and democratic participation are seen to be necessary to idea generation and to collaboration. However, a further important factor is divergence, indicated by the number of different content ideas or opinions generated. In the second idea linking stage, participants begin to agree, disagree, clarify and elaborate on their own ideas and other's ideas. Harasim describes this phase as involving a move toward collaboration through processes of comparing and contrasting the similarity and differences between participants' ideas. The phase is characterised by an increase in the number of replies and increased references to each other's ideas. In the last idea convergence stage, initial suggested ideas are converged to form a co-production, or identify a common position.

Applying Harasim's three major stages is useful for getting a quick sketch of students' collaborative interaction patterns, however, it has limitations in revealing more detailed features of collaborative behaviours within each stage. For example, expression of agreement and disagreement (in the idea linking stage) could have different functional roles within the discussion process. If participants agree on something, it may signal there is nothing left to discuss (a topic closure), or represent shared understanding or imply social support (Makitalo et al., 2002). Expression of disagreement can trigger subsequent negotiation processes like explanation, clarification of differences, elaboration to converge on a shared understanding or agreement (Knerser et al., 2001). Negotiation may occur

when there is disagreement, misunderstanding or ambiguity (Dillenbourg, 1999). Therefore, Harasim's model needed refinement and adaptation by developing sub-categories for each stage.

The detailed sub-categories were developed by mixing Harasim's examples of each stage and some move categories from Pilkington's DISCOUNT Scheme (1999) and Kneser et al.'s (2001) findings in relation to Exchange Structure Analysis (ESA). Later a deep qualitative reading and re-reading of the data in the two cases was used to refine these sub-categories further reserving only those categories which proved useful in describing the data for the purposes of this research.

Exchange Structure Analysis (ESA) as developed by Kneser et al. (2001) has some commonality with Harasim's model in that both analyze communicative acts in dialogue, so to speak, the individual's contribution to discussion. In Pilkington's Discount scheme, an exchange is a smallest unit of dialogue and minimally consists of one initiating and one responding turn and a minimum of two participants. Therefore an exchange is an indicator of interaction or engagement with each other. A turn is a contribution by a particular participant. A turn consists of moves which function as a speech act and consist of propositions. Kneser et al. propose four types of turn in exchanges; initiation, response, reinitiating and response compliment.

Idea generation stage is similar to Kneser et al.'s (2001) 'initiate turn' which opens a new discourse exchange and predicts a subsequent turn by another participant. Following the initiation turn, there are three types of turn; response, re-initiation and response complement. These sub-categories correspond to Harasim's idea linking stage.

Response turn includes moves such as agreement or disagreement with the other participant's stated position, or providing appropriate information in response to an inquiry. Reinitiation turn continues the current exchange and is related to repair work or argumentation, such as explaining, critiquing, clarifying, inquiring and elaborating. Kneser et al find that the dialogue moves in Pilkington's (1999) DISCOUNT scheme which were most likely to be associated with such re-initiation were clarification and challenge questions. In other words, the researchers found that re-initiation was one indicator of negotiation for shared understanding. Response Complement may express an opinion about the correctness or validity of response (for example a congratulation such as "that's fine, good") and acknowledges having heard the speaker and signals intention to close the exchange. Some social messages which expressed appreciation or praise without substantial comment are similar to this Response Compliment turn.

Based on this synthesis of both Harasim's phase model of conceptual change and some essential features of Pilkington's (1999) DISCOUNT model that took into account Kneser et al.'s (2001) findings in relation to ESA, the theoretical base of the coding scheme was developed as the following table 4.3. In the table, Harasim's indicative descriptions and examples of typical message in each stage are included in columns 2 and 4. These have been supplemented in column 3 with indicators based on the work of Pilkington (1999) and Kneser et al. (2001) with examples of these indicators in column 5. These examples are adapted from data presented in Kneser et al. (2001) and Guldberg and Pilkington (2006). These indicators and examples help clarify the theory-driven elements of the coding scheme and how to identify them in data.

<Table 4.3> Theory-driven coding schemes

<i>Harasim's (2002) three stages of conceptual change</i>	<i>Indicators</i>		<i>Examples</i>	
	<i>Harasim (2002)</i>	<i>DISCOUNT (1999)</i>	<i>Harasim (2002)</i>	<i>Based on Kneseer et al. (2001) and Guldberg and Pilkington (2006)</i>
<i>Idea generation</i>	Introductions, initiation, contextualising the discussion	Openers: initiating metastatements including 'Greetings', 'Task' and 'Self' meta-statements plus tutor instruct move	Introduction to the seminar topic by the moderator or participants' self-introductions "my name is so and so, and I work at such and such."	<i>Welcome!... the topic this week is.... please post your thoughts on this question in the message area</i> <i>My name is Eve I live in West Moppex and work in an SLD school. Where are you from?</i>
	Opinions - articulating individual perspectives on topic with no reference to other's opinions	Initiate with Inform moves often also with meta-statement 'Self'	Personal opinions are given about a topic, personal examples used to illustrate a position or particular point	<i>From a parent's point of view I think diagnosis is essential to ensure children receive the right help....</i>
	Inquiry - asking questions to gain more information to aid individual understanding	Inquire move asking for information or opinion	-----	<i>Can you give me an example?</i>
<i>Idea linking</i>	agreement	Response move such as 'agree' with 'evaluate' or 'justify', reply may include an Inform move to elaborate 'support'	Incorporating new ideas into one's thinking, or elaborating an existing idea with an example, or further questioning.	<i>Yes, you are making sense, and I'm glad you made that point, and from what I've been reading this week, autism is a biological defect and not just a behavioural issue.</i>

	disagreement	Response moves such as 'withdraw' or 'no-commitment' with 'justify', may include a reply move which elaborates the support	<i>Michelle, your comment really got me pondering this issue because I don't see it the same way. Can you tell us more about your concerns on this issue?</i>	<i>you said in your message ... 'perhaps children could be left in mainstream and be accepted for who they are', unfortunately they don't get accepted...</i>
	Challenging and clarifying inquiry	Reinitiate with an inquiry, referencing another participant's idea with a request for clarification, elaboration or explanation.	<i>Bruno, you said that 'such and such' and it makes me wonder how it would fit in the case of that and that?</i>	<i>He said "when cognitive structure and structural transformations are reconceptualised, most of the theoretical problems that were associated with Piaget's theory either disappear/are radically attenuated". Pls explain.</i> <i>I think he has explained the ways in which the cognitive approach has been refining basic Piagetian notions - what kids can do by when</i>
	Elaborating on ideas	Answer clarifying or challenging questions with appropriate inform or justify move		
	Providing information	Answer information-seeking inquiry with appropriate inform		<i>For example, hand gestures, nodding and shaking of her head, eye contact and eye direction</i>
<i>Intellectual convergence</i>	Summary or synthesis, common position,	Requires a depth of thread of at least 3 with one or more response suggested, maybe further	<i>"This discussion has been valuable in the focus on</i>	<i>what is IP?</i>

	conclusion	<p>refined through restatement or clarification question with convergence (agreement) on one response typically indicated with Response Compliment</p> <p>In ESA evidenced by markers of closure of exchanges, mainly Responses and Response Complements together with Reason and Plan Moves such as ‘Conclusion’, ‘Achievement’ ‘Explanation’ ‘Solution’ and ‘Suggestion’ with Meta-statements ‘Task’ ‘Sum’ and ‘Close-bid’</p>	<p><i>XXX...what about some of the related issues such as YYY?”</i></p> <p><i>“Thanks Mary for keeping us focused on making good use of our one-hour panel at the conference next month. I like the idea that you, Tom, and Elizabeth have been gelling about debatable topics that we panellists could discuss, citing examples from our own experiences”</i></p>	<p><i>Information Processing - excuse short-hand!</i></p> <p><i>In Radical IP stuff is truthful if it accurately reflects what is outside the mind.</i></p> <p><i>They see the environment as the only important source of knowledge about reality.</i></p> <p><i>Yes, at least they certainly emphasise this!</i></p> <p><i>Thank you everyone, I hope at last at the end of this session , I already move to medium prior knowledge level (?) learner !</i></p> <p><i>Has this been a model of social constructivism?</i></p> <p><i>YES!!!!!!</i></p>
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The next stage was to test the power of the scheme against the data in the two local contexts to see how they compared and contrasted. In the following, the data-driven aspect of the coding scheme development is further described.

The first finding was that the sub-category ‘introduction or contextualization of discussion’ in the initial theory-based coding scheme was not necessary when coding the actual case

data as students generally introduced themselves elsewhere (in prior tasks or in other discussion boards) before engaging in these discussions so they did not need to formally introduce themselves.

I read through the selected online discussion transcripts in the two cases and found that the discussion in the South Korean case had simpler structure compared to that of UK case. In the South Korean case, the first initiating messages in threads were mostly responses to the tutor posted discussion topics and 'Re' messages were short comments on peer's opinions. So, it was easy to differentiate and identify the types of statement. However, the discussion in the UK case had a more complex structure. In general, any message (whether the first response to the tutor's post or a response to a peer's response) contained multiple types of statements and sometimes related to more than one of Harasim's stages. In the UK discussion, the module tutor and online discussion facilitator participated in the discussion and students were required to read a pre-reading article, so, the first initiating messages in threads included the tutor's introducing the discussion topic (or a tutor's initial summary of the topic issues) followed by the students' individual opinions in response to the discussion topics, a student's summary of the recommended article, personal reflective comment on article, inquiry for information or opinion. The statement in 'Re' messages therefore contained not only idea linking and idea converging statements but also idea generating statements. I made a rule for consistent coding: I coded the statements which did not refer to other's name or other's statement as *idea generating*, although they were in a 'Re' message. Conversely, the statements which refer to other's name or statement were coded as *idea linking* or *idea convergence*, although they were in first or initiating message. However, sometimes it was difficult to identify whether a certain message was connected to other's statement or not. Some statements were, therefore, located in a grey area.

I read through the transcripts and coded the types of statement. Later, the types of statements drawn from the data were compared with the sub-categories in the initial theory-driven coding scheme. The sub-categories in the idea generating stage was refined into three sub-categories; 'opinions', 'raising new issues' and 'inquiry'. Here, 'opinion' and 'new issues' were divided as follows: the first is related to students' opinions in response to the tutor posted discussion topics, whereas the latter is students' ideas which trigger new discussion (although these sometimes overlapped with each other). Raising new issues (by students) can be interpreted as students displaying initiative in the online discussion by actively using it for their learning, as well as responding to the tutor posted topics.

In the South Korean case, the types of statement in response message included agreement, disagreement or challenge, sharing information, alternative suggestion or social statements (expressing empathy, appreciation, praise, encouragement). In the UK case, the types of statements in 'Re' messages included; agreement, partial agreement or partial challenge, challenge, elaboration or clarification, social statements (openers, closures, humours, thanks, appreciation, praise), providing alternatives or experiences, critical comment on the pre-reading article or personal summary of discussion. In general, there was no simple agreement or disagreement in 'Re' message in both cases. Agreeing or disagreeing with opinions was elaborated or supported with reason. In face-to-face discussion, turn-taking between discussants is more frequent and conversation is often fragmented with incomplete sentences and often one idea is co-constructed by different people in a sequence of interaction (Stahl, 2006, p. 292; Heckman and Annabi, 2003). However, turn-taking is less frequent and messages are usually composed of long, refined and complete sentences due to the available time for reflection in asynchronous online discussion.

Therefore, a message contained discourse that would normally flow over more than one turn in natural face-to-face dialogue. Challenging opinions involved self-explanation or elaboration in itself rather than asking clarifying inquiries to elicit peer's explanation or elaboration. In addition, when students expressed different opinions from peers', they tended to express them in a euphemistic and indirect way rather than direct challenge or disagreement: e.g., partial agreement and partial challenge, elaborating or clarifying peer's opinions or suggesting alternatives without explicitly expressing disagreement with the position statement. Therefore, the sub-category 'disagreement' in the initial coding scheme was replaced by 'critical comment' because it seemed to be more inclusive and adequate. Here, critical comment helped to see the concept from more comprehensive and different perspective by enriching and refining previously stated ideas. Therefore, the two sub-categories (in the initial theory-driven coding scheme) 'challenging or clarifying inquiry' and 'elaboration on ideas' were integrated into 'critical comment'.

Social statements were frequently found in student messages in both cases. In South Korean case, social statements frequently existed as an independent response. Especially in the week 4 discussion, the discussion topic encouraged exchange of personal information or feelings, so, responses were mostly social statements such as empathy with peer's feelings or mutual encouragement. However, in the UK case, social statements existed as a part of a message like in Harasim (2002). I have to decide whether or not to include social statements as a sub-category in idea linking stage. Harasim (2002) did not include social statements in her three stages of conceptual change model, although she found social exchanges (greeting, welcoming, self-introduction, humour, joking for ice-breaking purpose) throughout seminars. She views collaboration in online discussion as a conceptual change process, therefore, social exchanges are not directly related to conceptual change

process, although they support collaboration.

However, as mentioned above, social statements were frequently found as the sole response in South Korea case. If these responses are not counted as idea linking gestures, the majority of idea generating messages will be coded as monologues without responses, so, the coding scheme can not reflect accurately the interactive dimension of students' dialogue. In collaborative learning situation, cognitive aspects and socio-affective aspects influence together. Sometimes social statement such as praise (e.g., Good point!) can have feedback function to personal perspectives. So, social statement was developed as a sub-category in idea linking stage.

Accordingly, the types of statements in the idea linking stage in both cases were refined to include; agreement, critical comment, sharing information and social statement. 'Agreement' or 'critical comment' is response to the 'opinion' or 'new issues' in the idea generating stage. 'Sharing information' corresponds to the 'inquiry' in the idea generating stage. Therefore, the sub-categories in both cases matched together.

Identifying the statements indicating the final, intellectual convergence was difficult because of the ambiguous meaning of 'intellectual convergence' and the feature of asynchronous online discussion. In a small group face-to-face discussion, it would be easier to identify whether participants converged on shared understanding or not. For example, in a discussion with five members, if the third participant student summarized or synthesized the precedent two ideas and another student expresses agreement on the third student's opinion, then, it can be accepted as an idea convergence occurred. In addition, it will be easier to identify whether shared understanding occurred by catching the mood with the support of social context cues, even though there is no explicit agreement.

However, it was difficult to define idea convergence in large group asynchronous online discussion. First, there were multiple threads developed in each discussion. The size of threaded discussion was different; minimum 2 participants to maximum 9 participants. Threaded discussions mainly occurred between a small number of students (2-5), so, it caused a problem in accepting the shared understanding in small sub-group threaded discussion as a converged ideas in whole group level. Second, participant students posted only once and did not appear again in a threaded discussion, so, it was difficult to identify the response of the earlier participant student. By considering these limitations, the indicator of intellectual convergence was operationalized as occurring in a thread which has more than 3 participants and the last participant summarizes or synthesizes more than two precedent opinions and another student expresses agreement on the converged ideas. In asynchronous online discussion, students would avoid posting redundant ideas when they find someone already posted ideas which are similar to their own. For this purpose, threads with more than three participants were investigated to find the indicators of intellectual convergence.

The longest thread in the UK case showed one type of intellectual convergence: integration of different perspectives. It was composed of 11 messages posted by 7 students and online discussion moderator. The thread started with the volunteer starter student's message. He summarized the pre-reading article which dealt with learning and teaching style. The second participant raised a question; how to accommodate students' diverse learning styles in a large class with 35-40 students. There were two positions on the issue of matching teaching styles to students' learning styles. From one perspective it was impossible to meet students' diverse learning styles due to large class size, tutor's limited time, the difficulty of finding distinctive learning styles and the students' changing learning style over time.

From the other perspective it was possible to meet students' diverse learning styles by clustering students with several sub-groups who share common learning styles or providing mixed teaching styles. The starter student personally resolved the different perspectives by integrating the two; he suggested that the teachers should provide mixed teaching styles and students have to learn diverse learning styles.

The longest thread in South Korean case was composed of 11 messages posted by 9 students. A student, who worked an e-learning manager, raised a question: how to deal with the problem of decreasing number of e-learners in her company. In order to help her problem, peers shared their personal experiences from various positions as e-learners, e-learning practitioners or school teachers. So, the majority of messages were mostly sharing information by reflecting on their pervious teaching and learning experiences. There was no conflicting perspective. In particular, a student who worked as an e-learning content developer provided practical expert knowledge which could not be obtained from theory-based lectures or textbooks. Her message included e-learning content development process, tutor's role and various tips for motivating students. It was a quite long message, almost 3 pages of A4 paper. After reading her message, some peers commented like these;

“I newly got to know that these various components should be considered to develop e-learning content...”

“After reading your message, I became to reflect on myself...”

This type of statement implied that students enhanced understanding of an issue by contacting with peers' diverse knowledge and experiences, although there was no resolution of conflicting perspectives.

The third type was a shared understanding between students when they came across peers' similar opinions. The last was tutor's overall feedback and closure in the UK case. Accordingly, the types of statements in the convergence stage were refined to include: shared understanding or common position, integration of different perspectives, enhanced understanding and tutor's overall feedback and closure. Therefore, the content analysis coding scheme was finalized as the following table (see table 4.4).

In the UK case, I and my supervisor coded separately using the coding scheme. In case of disagreement, a single code was determined after discussion. The results of transcript analysis are presented in the related chapter (Chapter 5 and 6).

<Table 4.4> Final coding scheme: integration of theory-driven and data-driven

<i>Categories</i>	<i>Indicators</i>	<i>Examples</i>
<i>Idea generation</i>	Opinions	Personal opinions are given about a topic without reference to others' opinions, personal examples used to illustrate a position or particular point <i>"So to answer Rachel's questions...yes I think everything could be turned to PBL but I feel there has to be a reasonable mix between straightforward input and a requirement to self-discovery"</i>
	New issues	Introducing new ideas or new topic, beginnings of threads <i>"Reading the particular article, I came across with something that I always had in mind, as part of the initial training that I had in my first degree..."</i>
	Inquiry	Introducing discussion topics, asking opinion or information to aid understanding <i>"Could you share your experiences or tips for successful implementation of collaborative learning with us?"</i>

<i>Idea linking</i>	Agreement	Agreement on peer's opinion with elaboration or supportive information <i>"I agree with your opinion that it is difficult to control the online discussion being off-track"</i>
	Critical comment	Disagreement, partial agreement or partial disagreement, challenge with justification, clarification, defending on challenge. <i>"I agree with you..., however, ...the key issue is..."</i> <i>"I think the quality and quantity of questioning should not be assessed because..."</i>
	Sharing information	Providing information in response to an inquiry such as websites, journal article, practice-based or personal experience to add peer's knowledge and understanding <i>"The attached Jpeg is the resulting graph from my online assessment..."</i>
	Social statement	Social and affective statements <i>"Your account was very useful..."</i> <i>"I think everyone located in similar situation"</i>
<i>Idea convergence</i>	Shared understanding/common position	Summarise a common position in threads with more than 3 participants <i>"I would echo and agree with all of the comments made so far in this thread..."</i>
	Integration of different perspectives	Resolving different perspectives by integration
	Enhanced understanding	New insight or understanding by contacting with diverse information and opinions <i>"I newly got to know..."</i>

	Tutor's overall feedback	Tutor's closure of discussion with overall feedback <i>"Between you all you have done a great job of picking out the key points to think about..."</i> <i>"One of the interesting points emerging for me is the role of text in relation to audio and pictures..."</i>
<i>Others</i>	Tutor's discussion management (in the UK)	"Hi, everyone, Week 3 discussion on multimedia will be last until next Monday. Many students are welcomed. Thanks."

4.6. Ethical consideration

This study made certain that the rights of all the participants were taken into consideration and made provision for obtaining their permission and clearance. Special ethical consideration was given in case study 1 (asynchronous online discussion in the UK). With the advice of my supervisor, I submitted a Form EC2 to the Ethics Committee (see Appendix 2). This was done because the access to the online discussion board was confined to the enrolled students with password login. Although the discussion board is public space to the participating students it is also a private area where students express their opinions freely without the risk of exposure to others except the other online discussion participants, the tutors and members of the technical staff. The Committee confirmed that my research fitted within the University's Code of Conduct for Research and approved my research. After the approval, a written consent form was distributed to the students in the classroom session before the data were collected (see Appendix 2).

In the South Korean cases, the module tutor said that the approval from the committee was not necessary. So, when the instructor gave me consent the research to be conducted, an informed consent form was distributed to the students either by posting on the course

websites (cases 2 and 4) or in classroom sessions (cases 1 and 3).

In the informed consent form, I explained the purpose of research, the data collection procedure, how the collected data would be dealt to safeguard the participants' privacy, the students' right to confidentiality, the right of voluntary participation or withdrawal from the research and my contact details. All the participant students in the four cases submitted the informed consent form (see Appendix 3).

To guarantee the confidentiality and anonymity of all the participant students, a subject code number or pseudonym was assigned to each student and any sign of personal identity was edited in the process of data collection, data analysis and the dissemination of the results.

One exception was case study 3 (Wiki group project in the UK), in which I participated as a member of the research team. One member of the research team distributed a letter during an induction session describing the trial (See Appendix 3-3). The students were informed that their participation in the research for instance questionnaires and focus groups was entirely voluntary, their contributions would remain anonymous and their right to withdraw from the research would be respected. They were instructed to inform the research team if they did not want their data to be used in research, but none of them did so.

CHAPTER 5

ASYNCHRONOUS ONLINE DISCUSSION IN THE UK

5.1. Introduction

This case study asks if asynchronous online discussion can be used to support shared meaning making by supporting a means of communication through which a discussion artifact can be created, reviewed and added to though not by directly modifying another's work. These seminars take place in a blended form as part of a campus-based module in graduate course. Key research questions include;

- How do the students with multi-national backgrounds participate in asynchronous online discussion?
- Do students' interaction patterns in asynchronous online discussion evidence the indicatives of collaborative behaviours including; sharing opinions and information, negotiating different perspectives through explanation/elaboration/clarification to reach shared understanding, and socio-affectively supporting each other's effort?
- Does asynchronous online discussion benefit learning in the opinions of students with multi-national background? If so, what are the perceived learning benefits?
- What are the perceived merits and limitations of asynchronous online discussion for supporting learning and collaboration in this context?
- What contextual factors affect students' participation in the asynchronous online discussion?

5.2. The module

The study was carried out with a Master's course at a traditional campus-based university in the UK. The module title was 'Learning and ICT' in the spring term of 2007. According to the module overview, its aim was to analyze teaching and learning processes with a view to improving the use of educational technology in the classroom. The module tutor thought that students would find it easier to become educational practitioners if they modeled aspects of teaching and learning, gaining direct experience by putting them into practice. She believes in the value of active, constructive, reflective and collaborative working for deep learning. Therefore, she incorporated various ICT applications for teaching and learning, such as VLE (WebCT), e-mail, word processors, discussion tools, WebQuest, blogs and a small group project using wikis, so that students could use these tools in the classroom as normal adjuncts of their work as learners. In addition, she incorporated some exercises with the purpose of allowing students to experience collaborative learning and, through this experience, develop their ideas about the effectiveness of collaboration and collaborative dialogue for learning. The module class session was taught in the evening (Tuesday 5-8 pm) to allow part-time and working students to attend. It was usually a time when students were tired, so, the module tutor tried not to lecture too much, but instead posted lecture notes and related exercises on the WebCT. This decision was influenced by the module tutor's belief that active learning is deeper and is remembered longer. The exercises usually involved some reading of online notes or use of the Internet to search for key concepts and discussions with peers to produce a document as their answer, which they would post on the exercise discussion board on WebCT. Four discussion boards were built on the WebCT of the course to support students' learning activities: a weekly seminar discussion board, an exercise discussion board, the students' Web Project work discussion,

and a WebQuest Blog discussion. The functions of the discussion boards and the student participation levels were as in the following table.

<Table 5.1> Discussion boards and participation

<i>The title of discussion board</i>	<i>Purpose</i>	<i>Participants</i>	<i>The number of posted messages</i>
<i>Weekly online seminars</i>	Post seminar discussion responses	Students, module tutor, online discussion facilitator	107
<i>Assignments-exercises</i>	Post solutions to weekly exercise	Students	47
<i>WebProject Work</i>	Communication for web group project by posting messages and attachments, 4 project groups	Students, the module tutor	31
<i>WebQuest Blog</i>	Compile WebQuest materials	students	15

The focus of this case study was the weekly online seminars which were done outside the classroom session. The details of online seminar are described in the following section.

The weekly online seminars

The online seminar took the form of asynchronous online discussion using the discussion board facility embedded in WebCT. Usually, this module was enrolled with students from international backgrounds, so, the module tutor thought asynchronous online discussion would be better than synchronous discussion because of the international students' language barrier. International students' low participation is frequently referred to in other

research on cross-cultural courses or multi-cultural online discussion due to lack of proficiency to communicate in a foreign language (Cheng, 2000; Lee, 1997). The module tutor expressed her opinion for adopting asynchronous online discussion like this;

“Providing opportunity, especially for a mixed international group to discuss in English is very important, but expecting this group to do so confidently in real time, synchronously or orally, when the ideas are complex and expressed in academic language is very difficult. The few English native speakers will tend to dominate. Asynchronous online discussion gives much more opportunity for students to prepare by pre-reading papers and to offer more thoughtful reflection, giving everyone a much fairer chance to participate- and by reading others’ responses students can not only see what others think but are exposed to each other’s differing abilities to write effective argument in English which can be helpful without being as threatening as face-to-face discussion...”(in tutor interview)

The initial structure of asynchronous online seminar was as the following:

- 1) Provides students a seminar article for pre-reading
- 2) A student volunteers a starter role as an ice-breaker. The starter summarizes the recommended article and initiates a discussion by raising issues to discuss
- 3) Each seminar has a strict time schedule. It will start on Thursday 4 p.m. and finish by Monday, so, it will be held between face-to-face class sessions
- 4) Students were asked to post at least two messages (including one message for comment on peer’s message) to help develop discussion

5) The participation in online seminar was a voluntary activity, so, it was not directly related to the assessment

6) 'Netiquette' was posted on the discussion board as a behavioural code to follow when participating in the online seminar (see table 5-2)

<Table 5-2> Netiquette

<p style="text-align: center;">Netiquette</p> <p>Netiquette is an important part of participating meaningfully in an asynchronous discussion forum. You should consider:</p> <ol style="list-style-type: none">1. If you are asked to start the discussion you must be very prompt, say what you think and end by asking for other people's views.2. Don't flame other individuals (flaming is being critical of the person posting rather than the ideas). If you disagree always be polite and give a reason for your opinion.3. Try to focus on the positive – being constructively critical is good but remember to also comment on what you value in your peers' postings. Welcome and encourage others in conversation. When responding, look to see if anyone hasn't been responded to yet.4. Try to stay on topic and don't let your conversation go too far astray. Always check you are posting in a relevant section or replying to the right person before sending.5. Give everyone a fair chance to speak, don't dominate the conversation and be careful to consider everyone's ideas.6. If you are asked to provide a summary of the discussion try to fairly reflect everyone's contributions. Try to suggest what most people agreed with and what the main alternative perspectives were. <p>For reference, Core Rules of Netiquette by Virginia Shea (1994). Available at URL: https://www.educause.edu/pub/er/review/reviewArticles/29558.html</p>

Week 1 classroom session was spent in familiarizing students with the features of WebCT including asynchronous discussion board facility. Students were asked to send a message to the discussion board in order to introduce themselves to the group and reply to one other student. Therefore, the formal discussion started from the following week.

At the first formal online seminar (seminar 2), students participated actively by posting total 26 messages. However, I (online discussion facilitator) could feel students' enthusiasm noticeably decreased from seminar 3.

After my first posting on Thursday, I frequently logged on and checked whether someone had responded. However, no one responded until Friday morning. Although just one day passed, it was felt a much longer time passed. I could not be patient. So, on Friday morning, I sent a reminder email to the students to ask for participation as follows.

“Hi, everyone, Week 3 online seminar started! All students are highly welcomed. Looking forward to meeting you in online seminar! Thanks.”

Only one message was posted on Saturday midnight. Therefore, on Sunday, I sent the second email to all students again. Actually, students' participation increased as approaching the Tuesday classroom session.

Three students participated on Monday, 6 students participated on Tuesday before the class session and 3 students participated during the class session. Five messages were posted after the class session. Eventually, 19 messages were posted by 9 students.

Waiting for students' participation in online discussion was a fretful experience for me as an online discussion facilitator because there was no other way to attract students to the discussion board except for sending e-mails. Logging on to WebCT, opening the discussion board with expectation and finally finding no new message was a very frustrating experience. Having experienced this myself I wondered if other students would feel similar to me after posting their messages.

I reflected on the cause of low participation. First, one plausible cause was that the online discussion participation was not directly connected to the assessment. This might cause students' low motivation to participate. Second, even though the course was at Master's level, the students might lack the motivation to pre-read the article, so, feeling ill-prepared for the discussion, they might avoid participation. Third, another module activity requirement might distract their focus from this online seminar. This module included another weekly exercise in addition to the online seminar. Students were asked to evaluate some multimedia websites in the group work in the previous class and, those not finishing within the class, were asked to continue to work on the task out of class and post the finished result on another discussion space in week 3. Fourth, I thought students would expect the module tutor's feedback or participation in the discussion. This was influenced by my own previous experience of online discussion when I was in a Master's course in South Korea. I expected and valued tutor's feedback more than peer's feedback. As a learner, it's natural to expect tutor feedback on his/her understanding because tutors generally have more expert knowledge in subject areas. Maybe this preference for tutor feedback might be influenced by the Asian learning culture I am from or it would be a common student attitude, irrespective of cultural differences. Therefore, I discussed with the module tutor and changed some aspects of the online seminar structure:

- 1) The seminar period was extended. At the beginning, the online seminar finished before the face-to-face class session, but it was extended to after the class session. Students could be more prepared to participate and apply what they learned from the classroom session.
- 2) The module tutor participated as a wrapper to summarize the discussion
- 3) The role of student starter was abolished because no one volunteered for online seminar

3. Instead, I or the module tutor acted as a starter from the seminar 3.

Participant students

The participant students had diverse national backgrounds; 4 Cypriot, 3 British, 2 Taiwanese, 1 Indonesian, 1 South Korean, and 1 Turkish student. Therefore, only 3 students were native speakers of English and the other 9 students were non-native speakers of English. All nine international students were full-time students whereas the three British students were part-time students who worked as teachers. Most of the full-time international students were younger than the part-time British native students. Among the 9 international students, 7 were aged 21-26 and 2 were aged 27-32. Among the 3 British students, 2 were older than 39 and 1 was aged 27-32. Five students were males and 7 were female students. Ten students were enrolled in Master in Education in ICT, and 2 students were enrolled in other master's courses. Students electing to study this course can be expected to have higher ICT skills than those studying other courses within Education. The majority of students had previous experience of online discussion (9 students, 75%).

The majority of students responded that they were familiar with group discussion through their previous education (9 students, 75%). Students' response reflected different learning culture between Western country and Asian country: all 3 British students and 4 Cypriot students agreed, whereas 2 students came from East Asian countries (Taiwan and South Korea) disagreed. Online discussion is a form of written communication, so, students' writing skill is important for participation (Powell, 2000; Williams, 2003). Students' perceptions indicated that the majority were better at writing than speaking (9 students, 75%).

5.3. Data collection methods

Data were collected from the course website in WebCT, virtual participant observation, questionnaires, asynchronous online focus group and tutor interview.

Online documentation: module overview, lecture notes, information about learning activities, assessment and assignments, posted messages on the discussion boards were retrieved from the course webpage.

Virtual observation: as an online discussion facilitator, I could observe student participation virtually. I made a note of the atmosphere of online discussion, some peculiarities and my plan to facilitate discussion.

Questionnaires: questionnaires were conducted in the classroom session after students had experienced 4 online seminars. All 12 students returned their questionnaires, so, the response rate was 100%. The questionnaire was composed of 6 sections of closed questions and two open questions. Section 1 & 2 asked students' demographic background information (enrolled course, student status, gender, nationality, age, previous experience of online discussion etc). Section 3 asked students' perceptions and behaviours in online discussion. Section 4 asked perceived learning merits and barriers to participation. Themes identified in related literature were used to ask questions regarding merits, limitations and participation barriers. Section 5 asked students' perceptions about comparative merits of online discussion and face-to-face discussion. Section 6 was evaluation of online discussion experience. At the end of the questionnaire, two open questions were added; 1) some suggestions for improving online discussion, 2) personally perceived merits or limitations of asynchronous online discussion (see Appendix 4-1).

Tutor interview: tutor interview was conducted after the module ended. Semi-structured interview was used. Interview schedule included the purpose of integrating asynchronous online discussion to the face-to-face module, tutor's evaluation of the online discussion, tutor's role in online discussion (see appendix 5-1).

Asynchronous online focus group: asynchronous online focus group was used for collecting qualitative data on students' perceptions of several issues. The rationale for adopting the asynchronous online focus group was explained in chapter 4 (methodology chapter). The asynchronous online focus group used the normal asynchronous online discussion tool embedded in WebCT. The module tutor posted the discussion topics which I suggested and I moderated the discussion. When necessary, I posted follow-up questions as the discussion progressed (see Appendix 6-1). In the asynchronous online focus group, 11 students (out of 12) participated and a total of 12 messages were posted (on average 1 message per student). The online focus group discussion lasted from 15th of Feb to the 3rd of March.

5.4. Findings

First, overall students' participation patterns are analyzed quantitatively – total and average number of posted messages, the number of participants in each online discussion, the length of thread. Especially, the asynchronous online seminar was attended by students from diverse countries, so, students' participation patterns were compared at national sub-group level to find out whether asynchronous online discussion provided more equal participation, as expected. Second, students' collaboration pattern was analyzed with three selected online seminars by using the content analysis method referred to in Chapter 4 (methodology). Third, students' perception of their asynchronous online discussion

experience was analyzed by triangulating quantitative data from questionnaire and qualitative data from online focus group discussion.

5.4.1. Students' participation pattern in asynchronous online seminars

Overall participation

There were six online seminars. At the week 1 class session, students were instructed on how to use the features of the asynchronous online discussion board facility. So, the formal online seminar started the following week. In addition, some students who participated in the first seminar canceled the module after the first session. Therefore, the posted messages from the seminar 2 were included in the analysis.

In total 89 messages were posted by 14 participants (including 1 module tutor, 1 online discussion facilitator and 12 students) during 5 seminars (seminar 2~seminar 6). Some students made mistakes in posting messages in seminar 2 and 3 by posting same messages twice, a testing message or a self-correction message. This was caused by the VLE's inability to edit and delete falsely posted messages. Therefore, when students found any mistakes in their posted messages, they could not edit the messages. Instead, they had to reply to their own message to correct them or locate falsely posted messages. Therefore, the 5 falsely posted messages were excluded from the analysis, so, in total 84 messages were analyzed (see table 5.3).

<Table 5.3> Overall participation in seminar 2~seminar 6

	<i>Number of total messages</i>	<i>Number of student messages</i>	<i>Number of tutor messages</i>	<i>Number of participant students</i>	<i>Number of participant tutors</i>	<i>Average number of message per student</i>	<i>Seminar period</i>
<i>Seminar2</i>	23	15(65%)	8(35%)	10	2	1.5	18/01~30/01
<i>Seminar3</i>	17	14(82%)	3 (18%)	11	2	1.3	25/01~05/02
<i>Seminar4</i>	14	11(79%)	3 (21%)	7	2	1.6	03/02~9/02
<i>Seminar5</i>	18	12 (67%)	6 (33%)	11	2	1.1	15/02~06/03
<i>Seminar6</i>	12	9 (75%)	3 (25%)	8	2	1.1	06/03~27/03
<i>Total</i>	84	61	23			6.6	
<i>Average</i>	16.8	12.4(73%)	4.6 (27%)	9.4	2	1.32	

Student participation was not so much active. On average, individual students posted 1.32 messages per discussion, which were below the asked number of messages: 2 messages per seminar. Moreover, at the questionnaire response, only half of students responded they read all the posted messages.

The participation rate between the students and the tutors looked balanced. Among the 84 messages, students posted 61 messages (73%) and the two tutors posted 23 messages (27%). According to Berge (1995), online tutor's proper participation rate is between one-quarter to one-half of the contribution.

Students showed democratic participation. On average 9.4 students (out of 12 enrolled, 75%) participated in each seminar, so, the online discussion space was not dominated by a few students.

Although asynchronous online discussion provided anytime participation opportunity, students' participation was concentrated on certain days; Sunday, the deadline day (Monday), the class session day (Tuesday). 60% - 85% of student messages were posted on the three days. As approaching the face-to-face class session, students seemed to be aware of online discussion.

In general, students' participation was quite delayed, except for the online seminar 2 where students participated actively. There was several days' interval between messages in a thread. The longest time lag between the previous and the following message was 8 days in the seminar 4. However, when messages were posted on certain days (the deadline or class session day), the time lag became narrowed.

There were multiple threads developed in each online seminar. The term 'depth of thread' here means how many messages joined in a threaded discussion, from the initial message to the last message. The depth of thread can give an indication of the depth of interaction.

As seen in the below table, the majority of messages made threads, so, isolated messages were rare. Among the 5 isolated messages, 4 messages were the module tutor's 2 wrapping messages and the online discussion facilitator's 2 notice messages. So, the number of isolated message posted by student was just 1 message. The majority of threads (77%) were between level 1 and level 4.

<Table 5.4> The depth of threads

	<i>Seminar 2</i>	<i>Seminar 3</i>	<i>Seminar 4</i>	<i>Seminar 5</i>	<i>Seminar 6</i>
<i>Level 1</i>	2	1			1
<i>Level 2</i>		2	1	1	
<i>Level 3</i>	2				
<i>Level 4</i>	1	3		1	
<i>More than level 5</i>	1 (level 11)		2 (level 5, 7)	1 (level 12)	1 (level 11)

The comparison of student participation between national sub-groups

As stated, the students had diverse national backgrounds. Studies conducted with international students reveal that international students generally engage in limited participation and interaction in traditional face-to-face classroom environment due to their lacking language proficiency and unfamiliarity with the learning culture (Cheng, 2000; Lee, 1997). Asynchronous text-mode online seminar provides different participation environment than face-to-face verbal discussion for international students. In the following, the differences in online seminar participation between multi-national student groups were explored.

No dominance by the native speakers of English

Two criteria were selected in order to compare students' participation level: the number of posted messages and the length of posted messages. When reading the posted messages, I

could find that the number of posted messages was not an exact indication of students' participation level because some students posted frequently but their messages were often short and superficial, whereas some other students posted less frequently but their messages were long and contained valuable content. In general, writing a long message can be interpreted as showing the writer's high motivation and engagement with the discussion because long messages requires more time and effort than shorter messages. The following table shows individual student's participation level.

As seen in the below (table 5.5), the average number of posted messages per student was 5.25 messages during the 5 online seminars. The students who posted more than the average were 5 students: 2 British, 2 Cyprus, and 1 Indonesian student. The average number of words in a message was 167 and students who wrote above average length were 5 students; 1 British, 3 Cyprus, and 1 Indonesian student.

When considering the two criteria, 1 British student (Jake), 1 Cyprus (Lawrence) and 1 Indonesian student (Clark) were the 3 most active participants. They had diversity in demographic backgrounds; nationality or cultural background, student position (full-time, part-time), gender, previous experience of online discussion, English proficiency (although, they commonly seemed to have fluent English writing) and so on. Anyway, in this case, the native speakers of English did not dominate the online discussion.

<Table 5.5> Individual student's participation

<i>Student(pseudonym)</i>	<i>Number of message</i>	<i>Number of words in posted messages</i>	<i>Average length of message</i>	<i>Nationality</i>
<i>Jake</i>	11	3025	275	British
<i>Lauren</i>	7	491	70	"
<i>Olive</i>	3	423	141	"
<i>Lawrence</i>	7	1347	192	Cyprus
<i>Ruth</i>	5	1160	232	"
<i>Lora</i>	3	1227	409	"
<i>Gerry</i>	6	865	144	"
<i>Maggie</i>	4	513	128	Taiwan
<i>Jean</i>	5	477	95	"
<i>Dean</i>	4	357	89	South Korean
<i>Clark</i>	6	1091	182	Indonesian
<i>Lion</i>	2	90	45	Turkish
<i>Average</i>	5.25	922	167	

Comparison of three national sub-groups' participation

Although the sample size was small, there was a slight difference in students' participation according to their national background. The students were subdivided into 3 national/cultural sub-groups for comparison; British student group (3 students), Cyprus group (4 students), and East-Asian group (1 South Korean, 2 Taiwan). Taiwan and South Korean students were grouped as one because they had commonality in culture originated from Confucian heritage. However, two students (1 Indonesian and 1 Turkish student) were excluded in the comparison due to difficulty of inclusion to any sub-group.

<Table 5.6> Comparison of three sub-groups' participation

<i>Sub-groups</i>	<i>Average number of message</i>	<i>Average length of message</i>
<i>3 UK students</i>	7	162
<i>4 Cyprus students</i>	5	244
<i>3 East-Asian</i>	4	104

The three UK students ranked the first in the average number of message posting (7 messages per student), however, the average length of message was shorter (162 words) than the Cyprus group. The four Cyprus students posted on average 5 messages, however, the average length of message was longest among the three sub-groups (244 words). The three East-Asian students showed least participation in the number of posted message and the length of message; they posted on average 4 messages and the average length was 104 words. When considering the two criteria, the Cyprus student group participated most actively and enthusiastically. The module tutor also evaluated the Cyprus group students'

participation generally as excellent. However, this result should be read with caution due to small sample size.

The most active participant and the least active student

In this case, the most active participant student was Jake, a native British part-time student who belonged to older age group. He posted total 11 messages across the 5 seminars. Among the 11 messages, 6 messages were posted at the online seminar 2 when he volunteered the role of starter. His active participation seemed to be influenced by various factors. First, he was a highly motivated student who volunteered for the starter role in the first online seminar. Second, as a native UK student, he did not have English barrier in participation. Third, he seemed to be fascinated by the novelty and merits of online discussion. For him, this online discussion was his first experience.

“Even logging into the discussion board via WebCT was a learning curve for me. I had only glimpsed other people’s contributions onto discussion boards when surfing the net. When I became familiar with the way comments were loaded and displayed and the way that threads worked it became more of useful tool for me..., There have been more than one or two enlightening moments as a consequence of reading other’s contributions and I have enjoyed being part of the process...”

Last, he was highly motivated by the peer’s positive feedback on his first starter message. He revealed his feeling like this;

“...let me thank those people who approved of my starter observations-it has been a real confidence boost and is much appreciated. I also get quite involved in discussions ...”
(in seminar 2)

Although he looked very extrovert, humorous and witty person in the online discussion, he described himself as having “shy and retiring personality”. This may confirm the contention that introvert students felt comfortable in asynchronous online discussion (Bullen, 1998; Harasim, 1990). His messages often contained self-disclosing expressions, humor, sarcasm and slang expressions like these.

“I also get quite involved in discussion so if you get tired of hearing my voice then please do not hesitate to glance harshly at me – I promise to quit down and avoid sulking!”

“pin your ears back and listen ”

“I have finally got my teeth into this seminar...”

The absence of facial expression or gestures can make the online discussion space a cold and impersonal place. So, these expressions can make the online discussion space warmer and have a friendly mood if the participants share similar cultural background, so, they can understand those expressions easily without confusion. In relation to this, Benfield (2002) and Berge (1995) warned against the use of jokes, humour or sarcasm in online discussion where participants are from different cultural backgrounds because they may appear unfunny or it may be difficult to catch the intent or tone from on-screen text, unless participants know each other very well.

The least active participant was a male international student. Although he posted only 2 messages, he seemed to be actively engaged in the online discussion. In the post-questionnaire, he responded that he read all the posted messages and he enjoyed the online discussion (one of two ‘strongly agreed’ students) and reported that he believed online discussion was helpful to his learning. A technical problem in using asynchronous online

discussion tool, lack of knowledge about discussion topic (questionnaire response) and lack of English writing skill seemed to cause his low participation.

5.4.2. Students' collaboration pattern in the asynchronous online discussion

Students' collaboration patterns were analyzed by using the content analysis coding scheme referred to in chapter 4. The results are as in the following table 5.7.

<Table 5.7: Content analysis result>

<i>Categories</i>	<i>Sub-categories</i>	<i>Seminar 2</i>		<i>Seminar 3</i>		<i>Seminar 4</i>	
		<i>Student</i>	<i>Tutor</i>	<i>Student</i>	<i>Tutor</i>	<i>Student</i>	<i>Tutor</i>
	<i>Opinions</i>	1		3		3	
	<i>New issues</i>	4		3		2	
	<i>Inquiry</i>	1	1	1	1	1	1
	<i>Total</i>	6	1	7	1	6	1
<i>Idea linking</i>	<i>Agreement</i>	2	1	5		1	1
	<i>Critical comment</i>	6		7		1	
	<i>Sharing information/opinion</i>	3	1	2		3	
	<i>Social statement</i>	8	6	3	1	1	2

	<i>Total</i>	19	8	17	1	6	3
<i>Intellectual convergence</i>	<i>Shared understanding/common position</i>	1				1	
	<i>Integration of different perspectives</i>	1					
	<i>Enhanced understanding</i>						
	<i>Tutor's overall feedback</i>		1		1		
	<i>Total</i>	2	1		1	1	
<i>Others</i>	<i>Management of group discussion</i>		3		3		1

As seen in the above table, smaller number of each category caused by low participation made it difficult to find any distinctive trend in students' collaboration patterns. However, a range of collaborative behaviours were found. Students gave thoughtful comments and tried to build on each other's ideas by making a thread. However, the majority of threaded discussions did not extend to a deeper level. Simply comparing the number of statements between idea generating and idea linking, there were 22 idea generating statements, 54 idea linking statements. So, each idea generating statement received on average 2.5 idea linking responses. When excluding the social statements which occurred in almost every message, there were 33 idea linking statements, therefore, idea generating statements received approximately 1.5 substantial comment. This implied that initially expressed ideas were not actively discussed from multiple perspectives in the idea linking stage.

The majority of threaded discussion ended without any conclusion or idea convergence. There were multiple threads in each seminar: 7 threads in the seminar 2, 6 threads in the seminar 3 and 3 threads in the seminar 5. If each threaded discussion developed well, each thread had to have its own idea convergence statement. However, there were only 5 indicators of idea convergence.

In the idea generating stage, students did not maintain the passive role of responding to the tutor posted discussion topics. They used the online discussion actively for their learning by initiating new threaded discussions by raising new issues.

In the idea linking stage, there were almost similar number of agreeing opinion (10) and critical comment (14). Critical comments were directed to peer's opinion or the pre-reading article. Students responded to peer's opinion politely and constructively, so, there was no flaming. Critical comment involved justification or elaborated explanation, so, it was constructively critical. When students gave critical comment on peer's opinion, it was expressed in a polite and indirect way. This might be intended to avoid confrontation or rude expression. For example, critical comments were often expressed as part agreement and part challenge (agree...however, ...) instead of direct disagreement like the following examples:

I totally agree with you! CAL may be a very useful tool in teacher's hands, but it will never substitute him/her in teaching. However, we have to admit that CAL can provide to the students things which teacher is unable to give them...(in seminar 3)

DS is right in saying that it is not an easy task for teachers to do so due to the fact that many schools still represent "big class"(40-50 students per classroom) ... I believe that

they share some common learning style. With this in mind, teachers can easily accommodate the different styles of learning during their teaching. Of course, it is not as easy as it appears, but it does not necessarily mean that it is impossible to do. (in seminar 2)

This was contrasted to critical comment on pre-reading article, in which critical comment was more directly expressed like the following.

There is also implied contradiction with the article. Schar and Kruegar state that 'studies show that people prefer voice to text and prefer voice in addition to text even when it doesn't improve performance' (page 42-3rd paragraph). But this seems to be contradicted on paper 43 when detailing 'verbal versus nonverbal' - "On the other hand, the combination of text and language has a negative impact." Do people really prefer to learn in a manner that is intrinsically inefficient?(in seminar 3, Jake)

Social statement was prevalent in every message. They were mostly appreciation or praise of peer's contribution, so, made the seminar mutually supporting and respecting atmosphere. Overall, students' interaction patterns seemed to follow the tutor's guideline 'Netiquette'. According to it, students were asked to "Try to focus on the positive – being constructively critical is good but remember to also comment on what you value in your peers' postings. Welcome and encourage others in conversation" (Netiquette 3).

When reviewing the transcripts, critical comment was expressed by students from diverse national backgrounds. Simply comparing the number of critical comment according to nationality, the result was: Cyprus students; 5, the UK students; 5, South Korea; 2 and Indonesian; 2. It seemed that culturally Western learners (UK and Cyprus) expressed more

critical thinking rather than culturally Asian students. However, this can be influenced by their participation level.

However, critical comment did not elicit any response or counter-argument (such as defending or explanation) from the first participant. Critical comment was generally given one-way, not two-way.

This seemed to be influenced by the written mode of discussion and low participation. In general, students posted well-organized and refined ideas once and rarely appeared again. Student messages were written logically and formally, so, had the feature of 'academic mini-essay' as Thomas (2002) described. They contained the structure of introduction, main ideas and personal conclusion, although not complete. Main ideas were supported and justified with elaboration and clarification. In addition, the asynchronous and written mode discussion limits immediate exploration process when there is a question or misunderstanding. Although asynchronous online discussion has interactive dimension, it is a limited interaction compared to spoken discussion in which interactive dimension is much stronger, so, initial ideas are easily refined and negotiated through sub-sequent clarifying and explaining processes from different participants. Instead of asking clarifying and challenging inquiry to elicit peer's explanation, students supported or justified their critical comment with elaboration or clarification in their own words, and then, asked others for feedback on their arguments (e.g., "That's my brief comment. Any further ideas? Come on..."). However, the majority of these feedback requests were not responded to by the first participant or other students, so, discussion ended without further exploration. Therefore, it was difficult to identify how the first participant's initial idea was influenced by the critical comment.

These interaction patterns seemed to imply that students placed more emphasis on individual meaning making and other's feedback on their own ideas rather than negotiating shared understanding or meaning making.

Students' prior teaching and learning experiences played a critical role in discussion. When students provided information or alternatives, the main source was their prior teaching and learning experiences rather than theoretical knowledge. For example,

My experience showed me that collaboration should not be used in every lesson. It depends I think from the nature of the information that should be taught. For instance, in history is almost impractical to use collaboration teaching...So, what I do in history is describes as follows; I include one or two small collaborative task between groups of 2 in terms of discussion, transform facts into an action story and asking students' opinion in specific moments (Ruth in seminar 4)

"I agree with Gerry and Ruth. My experience indicated me that technology can enhance the teaching and learning process..." (Lawrence, in online seminar 3)

Hara et al. (2000) also found that graduate students meta-cognitively engaged in reflecting on experience. Knowles (1973, p. 59) contends that adult learners' life experiences are rich resources for learning and a cognitive base to relate and to interpret new concepts.

In the asynchronous online discussion, multiple threads developed. If discussions in threads developed in-depth level, each thread should have its own indicator of idea convergence. However, there were only 1-2 summaries in each online seminar. The module tutor's wrapping messages and student's individual summary messages could be interpreted as an end of threaded discussion. However, there was ambiguity to conclude

these as indicators of idea convergence. There was no evidence or social cues of whether other students read the summary message or whether they agreed on them. The following is a student's summary of a threaded discussion. His summary message ended with asking for other's feedback, however, there was no response.

...The comments others have added that I would like to echo here are from Clark (where it was identified that learning styles would be shared amongst a group) and Lauren (where I suspect she has a similar experience to mine - where a group of people answer a set of questions to determine their learning styles). In the group I underwent this assessment with there were only a few with distinct leanings to being pragmatist/activist or theorist/reflector types.

I think Gerry and Olive have the best work-around possible where Gerry looked at the paper's recommendations for a mixture of teaching styles and Olive (as a practicing teacher) states that the pupils need a variety of learning techniques. What I try to do in lesson planning is demonstrate where different learning styles are to be met where possible. Anyone agree/disagree? (summary by Jake)

To summarize, students displayed a range of collaborative behaviours in the three discussion transcripts, however, the frequency was low. Students shared personal opinions and experiences, negotiated understanding by giving critical comments, confirmed common understanding with agreement and supported each other's efforts with social statements. However, knowledge negotiation processes remained at an initial stage because critical comment was given one-way (without the first participant's or other student's counter-argument or response of acceptance).

5.4.3. Students' perception of asynchronous online discussion experience

In the following, students' perception of learning merits, limitations, barriers to online discussion participation are presented. Qualitative data from asynchronous online focus group and quantitative data from questionnaire are presented together to provide both the general trend and students' own voice. Considering students' multi-national backgrounds, students' responses are compared according to the nationality, when necessary.

5.4.3.1. Students' evaluation of asynchronous online discussion experience

Overall, students evaluated their asynchronous online discussion experience positively. Most of students agreed or strongly agreed with the statements 'I enjoyed online discussion' (9 students, 75%) and 'Online discussion was helpful to my learning'. The integration of asynchronous online discussion into the face-to-face module was perceived highly positively (11 students, 92%). Students evaluated more positively of the quality of discussion rather than the quantity of participation; 8 students (67%) agreed with the statement 'I was happy with the quality of online discussion', however, only 4 students (33%) agreed with 'Everyone participated actively in the online discussion'.

<Table 5.8> Students' evaluation of their online discussion experience, N=12

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>I enjoyed online discussion</i>	2 (17%)	7 (58%)	3 (25%)	

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>Online discussion was helpful to my learning</i>	1 (8%)	8 (67%)	3 (25%)	
<i>The integration of online discussion enhanced the quality of this module</i>	3 (25%)	8 (67%)	1 (8%)	
<i>I was happy with the quality of online discussion</i>		8 (67%)	4 (33%)	
<i>Everyone participated actively in online discussion</i>		4 (33%)	6 (50%)	2 (17%)

5.4.3.2. Students' learning from participating in asynchronous online discussion

Improvement of critical thinking and confidence

Online focus group

Owing to the asynchronous feature, students can have time to think and reflect on various aspects when responding to the topics or peers' opinions. Students were able to be more thoughtful and critical in their thinking and so, could participate more confidently. The following are quotations from the online focus group.

"...I think it can support a critical and collaborative learning, because I have much time and opportunities to think more critically. Another benefit is that online discussion can

make me more confident when posting some comments. Perhaps it is different from when I have a face-to-face discussion. Sometimes I feel reluctant to give a critical thinking...”
(An Asian student Clark).

“The advantages are that I had time to think about the subject first and express my thoughts. That helped me to think more critically taking into account almost all the aspects of the subject.” (Cypriot student Gerry)

Questionnaire response

Most of students agreed or strongly agreed with the statements ‘Writing messages helped me to develop my critical thinking’ (83%, 10 students) and ‘Reading other’s messages helped me to develop my critical thinking’ (92%, 11 students).

Writing one’s own message and reading other’s message are basic processes of participating in online discussion. Writing one’s own message is comparable to speaking and reading other’s message is comparable to listening to other’s opinion in face-to-face discussion. Critical thinking is the ability to assess evidence and reason based on relevant evidence properly, or to understand the bigger picture holistically and to see different perspectives (Ennis, 1996: Paul, 1982). The writing process involves reasoning processes including planning, actively manipulating and summarizing related knowledge and experience to construct one’s own opinion, monitoring the coherence of arguments. By reading peer’s diverse perspectives, students can overcome their own narrow-perspective and see the topic from multiple perspectives. These processes are related to critical thinking or higher order thinking (Tierney et al, 1989).

Peer learning opportunities

The student group was composed of multi-national backgrounds, therefore, there were problems in understanding and generating English (different accents, the use of idiom or slang presented comprehension problems whilst the need for prompt response created pressure on fluent generation). This could constrain easy and substantial discussion on academic topics in a face-to-face situation. Whilst there remained some similar issues for comprehension, the asynchronous online discussion provided more opportunity for equal and comfortable participation and in-depth discussion in which students shared ideas and experiences with peers from different countries or cultures.

“...Especially when the students come from different countries, an online interaction tool like Web ct can be very useful because it implements students into authentic conversations and motivates students to take part in the conversation,... Moreover, people who take part in online conversation learn from each other and exchange their views on specific topics...” (Lawrence)

Questionnaire response

Almost two-thirds of students (8 students, 67%) agreed with the statement ‘Online discussion motivated me to learn more about course content’.

Improvement of communication skill

Online focus group

Participants have to express their ideas in written English in the asynchronous online discussion. If students participate actively, English communication skills can be improved.

... students improve their language and communication skills... (Cypriot student Lawrence)

Questionnaire response

Although there were only 5 online discussions, 50% students (6 students) responded that these discussions could improve their writing skills. Especially, the East Asian, Indonesian and Turkish agreed more (4 agreed out of 5 students) than the Cypriot students (1 agreed, 3 disagreed) or the UK students (1 agreed out of 3 students).

Improvement of sense of community between multi-national students

Online focus group

By reading peers' messages, students get to know each other's thoughts and experiences. The more students get to know each other personally, the more they feel close feeling each other. This contributed to community building.

“ ...learners with different educational background can work together and share their knowledge, experience and thoughts. Through online discussions empathy and awareness of each other's needs and perspectives are developed...” (Lora)

“What I found is that even though my student colleagues are from different countries and backgrounds there does appear to be a lot in common between us all.” (Jake)

Questionnaire response

The majority of students (10 students, 84%) agreed with the statement 'Online discussion promoted a sense of community with peer students'.

Others

Students with no previous experience of online discussion can learn related ICT skills (e.g. how to use discussion board functionality, how to respond to the previous message, or how to upload files). However in this case, the majority of students (9 students) already had previous online discussion experiences (from the questionnaire responses), so, they were already skilled at using the online discussion tools. Therefore, the majority of student's response was negative with the statement 'Online discussion enhanced my IT skills' (8 students disagreed, 67%).

<Table 5.9> Perceived learning merits of online discussion, N=12

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>Online discussion motivated me to learn more about course contents</i>		8 (67%)	4 (33%)	
<i>Writing messages helped me to develop my critical thinking</i>	2 (17%)	8 (67%)	2 (17%)	
<i>Reading other's messages helped me to develop my critical thinking</i>	1 (8%)	10 (84%)	1 (8%)	
<i>Participation in online discussion improved my writing skills</i>		6 (50%)	5 (42%)	1 (8%)
<i>Online discussion enhanced my IT skills</i>		4 (33%)	5 (42%)	3 (25%)

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>Online discussion promoted a sense of community with peer students</i>		10 (84%)	2 (17%)	

5.4.3.3. Perceived merit and limitation of asynchronous online discussion

Merits

Convenient and comfortable participation opportunity for international students

Online focus group

Especially, international students seemed to feel more comfortable in asynchronous online discussion because they could be relieved from English stress and embarrassment when participating synchronously.

...Plus I wasn't stressed about the language, because I had the time to think about it and use the right word for it, instead of trying to find the words, being stressed and at the end probably give the wrong message." (Cypriot student Gerry)

"It keeps me away from embarrassing" (Lion, international student)

Questionnaire response

The majority of students confirmed this merit by agreeing on 'I felt comfortable to express opinions in online discussion' (10 students, 83%).

Cognitive aid for reference

Online focus group

The archived messages can be accessed repeatedly and selectively for reference, this quality helps support individual's limited cognition and memory. In particular, the international students could read other's messages repeatedly, so, could understand them more thoroughly.

...Asynchronous online discussion like this online seminar is easier to participate and catch up with the discussion because we can read the messages several times until we fully understand...(Olive)

"... saw the comments/ideas/experience that you consider noteworthy."(A Cypriot student in the open-questionnaire response)

Limitation of asynchronous online discussion

Lack of connection between messages

Online focus group

Serial monologue type discussion or lack of interaction was frequently referred to as a limitation of asynchronous online discussion (Hara et al., 2000; Pawan et al, 2003; Wang and Woo, 2007). Some students raised a lack of connection between messages and lack of feedback as limitations of asynchronous online discussion.

"People posting comments rather than replying to what was up there. Seemed disjointed and not very useful"(Lauren)

“I always expect some feedback... however, it seems that it's not work here. What I feel is that there's no good 'connection' among us. The discussion seems 'individual' and not continuous...”(Maggie)

Questionnaire response

Student response was somewhat mixed with the statement ‘Lack of prompt feedback disappointed me’ (5 agreed, 7 disagreed).

Other limitation

Asynchronous online discussion takes more time in communication due to text-based and delayed interaction. However, the majority of students did not think “online discussion is ineffective and time consuming” (8 students, 67%).

There was a difference in response between the native students and international students. The majority of international students (8 out of 9 students) disagreed or strongly disagreed, whereas the 3 British students response was mixed; 1 student (who participated most actively in the online discussion) disagreed, another student took moderate position by responding ‘sometimes’ agreed, and the other student agreed.

<Table 5.10> Merits and limitations of asynchronous online discussion, N=12

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>I felt comfortable to express my ideas in online discussion</i>	1 (8%)	9 (75%)	2 (17%)	
<i>I think online discussion is time-consuming and ineffective</i>		3 (25%)	7 (58%)	1 (8%)
<i>Lack of prompt feedback disappointed me</i>	3 (25%)	2 (17%)	6 (50%)	1 (8%)

5.4.3.4. Barriers to participation in asynchronous online discussion

English writing barrier for the international students

Online focus group

Although asynchronous online discussion lowered international students' participation barrier, English writing skill was still perceived as the main barrier. Five international students mentioned about this barrier. A student from Asian country, who was one of the most active participants and wrote quite well, raised this issue first.

"...one barrier that sometimes makes me feel reluctant to give comments through this webCT is language (English). Sometimes I found difficulties in expressing my opinions in English....I can compare when I have asynchronous online discussion with my friends in

the same language, I can post many pages of words...” (Clark, in online focus group discussion).

A Cyprus student, who was also one of most active participants, agreed with the above student like this;

“As a foreign language student, I face the same problems in speaking and writing, as you do...”(Ruth)

Another Asian student expressed her embarrassment when writing a message in English.

“I have the same feeling that language is the main barrier which stops me to post my opinion in online discussion board. However, it’s just a very simple idea and somehow I think the stupid personal experience. So, I am embarrassed to post it...”(Jean)

However, another Cyprus students’ opinion was different. He contended that English was not perceived as a big obstacle because of the ‘asynchronous’ trait.

“As for the language issue, I do not believe that being a foreign student is a big problem that make the contribution to a conversation very difficult because in asynchronous online discussions you have time to read many times your text before you post it”(Lawrence)

Questionnaire response

Five students (41%) agreed ‘lack of writing skill’ as a barrier. Especially, Asian students agreed more than the UK students or Cypriot students. All 3 British students and 3 Cypriot students (out of 4 students) disagreed, whereas all 3 Asian students agreed with the

statement 'Lack of writing skills hindered my participation in online discussion'. This response corresponded to the Cypriot students' long and well-written messages compared to Asian students.

Time barrier, especially for part-time British students

Online focus group

A British student raised '*lack of time*' as a barrier to participation (Olive, in open questionnaire response). For the part-time students who have compact time schedule, the anytime participation opportunity seemed not to be perceived as a practical merit.

Questionnaire response

Overall, 50% (6 students) agreed or strongly agreed with 'lack of time' as a barrier. There was a difference in response between the part-time British students and the full-time international students. The three part-time British students all agreed, whereas the full-time international students disagreed more (6 disagreed out of 9 international students).

Avoidance of redundant message posting

In online discussion, students' messages are archived with their identifiers, so, participants can repeatedly view who said what in its exact form. According to Guzdial & Carroll (2002), students would not post their ideas when they find similar ideas from other's posted messages in order to avoid redundant contribution, so, this can be a cause of low participation. Students' responses confirmed this barrier. Eight students (67%) agreed with the statement 'Sometimes I gave up posting messages because peers posted similar opinions'.

Preference to studying course materials than online discussion participation

When students have conflicting time schedules, they would allocate time according to their priority. Some researchers (Fung, 2004; Oliver and Shaw, 2003) contend that students allocate a low priority to discussion participation, when participation is not related to assessment. In this module, online discussion participation was not directly related to assessment for grade, so, students might place low priority on discussion participation. In addition, students were required to participate in other weekly exercise works. This also might distract students from focusing on the online discussion. More than half of students (7 students, 58%) agreed or strongly agreed with the statement 'I prefer studying course materials to participating in online discussion', implying less priority on discussion participation.

Lack of knowledge about discussion topic

Students' level of knowledge about the discussion topic influences their discussion participation (Gerbic, 2006). A sizable number of students agreed (5 students, 41%) with the statement 'Lack of knowledge about discussion topic hindered my participation'. In general, the UK and Cyprus students who study Med in IT disagreed, whereas the students who study other subjects agreed more.

Other minor barriers

Due to archived nature, the posted messages are located under open scrutiny for the quality from peers or instructors (Hammond, 2000). This can hinder some students' participation in fear of looking silly or revealing lack of knowledge (Weaver, 2005). However, the evaluation concern was not perceived as a big barrier for these students; only 2 students

agreed on ‘I hesitated to post because peers would evaluate my message contents’.

Technical problem was not a serious barrier for the most students in this case; only 1 student agreed. As he was the least active participant it may have been a serious issue for him.

<Table 5.11> Barriers to participation, N=12

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>Sometimes I gave up posting messages because peers posted similar opinions to mine</i>		8 (67%)	4 (33%)	
<i>I prefer studying course materials to participating in online discussion</i>	1 (8%)	6 (50%)	5 (42%)	
<i>Lack of time hindered my participation in online discussion</i>	2 (17%)	4 (33%)	6 (50%)	
<i>Lack of writing skills hindered my participation in online discussion</i>	1 (8%)	4 (33%)	5 (42%)	2 (17%)
<i>Lack of knowledge of discussion topic hindered my participation</i>	1 (8%)	4 (33%)	7 (58%)	
<i>I hesitated to post because peers would evaluate my message contents</i>	1 (8%)	1 (8%)	8 (67%)	2 (17%)

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>I had some technical problems to access online seminar tools</i>	1 (8%)		7 (58%)	4 (33%)

5.4.4. Perspectives on tutor's role

5.4.4.1. The module tutor's perspective

The module tutor posted the discussion topics at the beginning, wrapped each discussion at the end, however, rarely presented herself in the middle of discussion. The module tutor had the expectation that post-graduate students should self-regulate their discussion without tutor's intervention.

"I want the students to do most of the talking and develop the skills of listening to each other and challenging points with each other. I want them to work out for themselves what they think... But what they really need to learn is how to think for themselves..."

From her previous experiences, she learned that tutor's too frequent intervention led to tutor - dominated discussion, therefore, hindered students' active participation.

"...I have done discussions around academic papers where I have participated freely just putting in what I think and I found in that case I tended to dominate being responsible for over a third to half of the conversation. That is still better than leading a face-to-face discussion where the teacher talks for 60-80% of the time, but it is not what I want..."

Therefore, she thought rather detached attitude would be better than direct and frequent

intervention, although monitoring discussion and correcting big mistakes was still tutor's role. When she intervened to point out students' misconception, she only gave hint and did not give direct answers.

“If there are big mistakes I should be able to catch that and gently correct them. So I should not just forget about the discussion. There needs to be a balance. I need to monitor the discussion, be aware when someone is contributing and try to encourage them by asking what people think or introducing new sub-questions to think about. But if I come in to the conversation and say ‘Stephanie that is wrong...’ then Stephanie is unlikely to participate again in that discussion. And if I answer one of the sub-questions with what I think, no one is going to challenge that by putting in a different idea. So I think it is better to try to say what I think toward the end of the discussion without naming.”

Aside from her perspective of tutor's role, another practical barrier was 'time'. She was busy with other urgent compulsory activities; research project, lecture preparation, marking, research student personal tutoring, and so on.

“Time. It was always difficult to make the time- the weeks go round so quickly and there is so much preparation and marking to do. I also have research projects with deliverable deadlines. The Masters course competes with my doctoral course for time in the spring term with many students wanting to meet me for personal tuition and to comment on drafts of their work....It is a voluntary activity and there are so many compulsory activities that are more urgent! I am just like students...”

She put some summary comments into the discussion at the end. In addition to this online

seminar, she gave actively personal comments on the individual students' works in the exercise discussion board and web project discussion board. She evaluated the asynchronous online seminar had many advantages for her and students in that: students could see each others' ideas, practice generating ideas/ arguments in English in a less threatening way than face-to-face discussion and have a resource of ideas. She could see if students were thinking roughly on the right lines, have a chance to give them some formative feedback before they write something in their essays and help build relationships across the group and with her.

5.4.4.2. The online discussion facilitator's perspective

I, the online discussion facilitator, posted total 16 messages across the five seminars. I was educated in a learning culture where discussion is rare in class and had no previous experience of online discussion facilitation. However, I had previous experience of online discussion participation as an online distance learner in South Korea. In South Korean course, the instructor selected several messages and gave individual feedback at the end of each discussion. At that time, reading tutor's feedback, especially given to me, was a very stimulating and exciting experience.

As an online discussion facilitator, I made a rule to log on and check the discussion board twice everyday (in the morning and in the evening), and respond promptly when students posted. However, motivating student participation and facilitating quality discussion were big challenges.

When students' participation decreased from the online seminar 3, I confronted with the problem of how to motivate students' participation and what should be the role of online

discussion facilitator in this quiet discussion where students did not appear. The only way to motivate students' participation was sending emails to notify online discussion started like this.

"Hi, everyone, Week 3 discussion on multimedia will be lasted until next Monday. More students are welcomed. Thanks."

Another problem was my lack of discussion facilitation skill and lack of wide background knowledge about discussion topics. As an online discussion facilitator, I expressed my feeling like this in the online focus discussion.

"...I wandered about the proper role of it. I thought that my position is a research student, so, I don't have the authority of a teacher, that means, my active intervention into the discussion process would invoke not good feeling (moreover, to be frank, as a student, I lacked the expertise on the discussion topic and how to direct the discussion process constructively^), so, just maintained passive facilitator, alerting online discussion by emailing..."

Therefore, my main role was greeting and appreciating students' participation with social messages without substantial comments like these.

"Thank you for your kind information, Jean! Cheers."

"Thanks, Ruth, Could you share your experiences or tips for successful implementation of collaborative learning with us? Cheers."

Although I made a rule to check the discussion twice per day, my participation was also influenced by students' participation level. When there was no new message for a few days,

I lost the motivation to log on, so, sometimes skipped logging on and checking the discussion board.

5.4.4.3. Students' perceptions of tutor's role in online discussion

Questionnaire responses

Students' response in the post-questionnaire indicated that the majority of students preferred 'the tutors to take more active role in online discussion' (9 students, 75%), however most also agreed that they preferred 'more interaction with peers than tutors in online discussion' (8 students, 67%).

<Table 5.12> Students' perception of tutor's role, N=12

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>I prefer the tutors to take more active role in online discussion</i>	2 (17%)	7 (58%)	3 (25%)	
<i>I prefer more interaction with peers than tutors in online discussion</i>		8 (67%)	4 (33%)	

Researchers contend that there is a difference in students' learning style or learning culture between students from the West and the East-Asian cultures (Liang and McQueen, 1999; Tweed and Lehman, 2002). According to them, students from the West are more accustomed to student-centered learning, whereas the Asian culture students are more used to teacher-directed. However, in this case study there was no distinctive difference in

response on these two statements according to students' cultural differences, although the sample size was small. As to the first statement, the 2 strongly agreed students were a British student and a Cyprus student and the 3 who disagreed were 1 British and 2 Asian students. The 8 students who agreed to the second statement also had diverse nationality.

Online focus group

Only three students (2 East Asian, 1 Cypriot) expressed opinions concerning the tutor's role. To summarize, they expected the tutor should actively facilitate the discussion by encouraging participation, weaving and summarizing disconnected students' messages, asking probing questions to facilitate critical thinking on main issues, and repairing students' misunderstanding.

"I think the tutor's position of the discussion is like a facilitator. The instructor should motivate and interfere when the discussion does not progress well." (Dean from Asian country)

"What I feel isthere's no good connection among us. The discussion seems individual and not continuous.... In this kind of situation, I think tutor can intervene the discussion a little..."(Maggie from Asian country)

"The role of the instructor, I think is not to lead the students to specific elements, but rather set some points to motivate him/her to think and develop his knowledge and opinion on the particular subjects. Furthermore, I think the instructor should follow the conversation closely and when there is a misunderstanding, he/she should interfere."(Ruth)

There was a contrast between the tutor's perspective of her role and students' expectation of tutor's role. The tutor expected the students to manage their discussion autonomously, however, the students expected tutor's active facilitating roles. However, considering the module tutor's active feedback on students' group project tasks in other discussion board, she may have intervened less because she had an online discussion facilitator.

5.5. Summary and discussion

This study was carried out with students having multi-national backgrounds. Although there were differences in the levels of individual participation, on average 9.4 students (out of 12 who enrolled) participated in each discussion.

As the module tutor intended, the asynchronous online seminar provided the students with a fairer chance to participate. The native British students did not dominate the discussion, although they had the advantage of English, unlike the international students. This finding is in agreement with the finding of Yildiz and Bichelmeyer (2003), who compared asynchronous online discussion participation patterns between native speakers and non-native speakers of English in the USA context. They found that native speaker students did not dominate the discussions. International students are likely to be nervous and embarrassed when communicating their ideas in face-to-face discussions in a foreign language. However, asynchronous online discussion appeared to provide more comfortable participation for the international students because it gave them enough time to compose and refine their ideas before posting. In addition, the international students in this case were in the majority (9 international students, 3 British students). This may have provided a more comfortable participation environment for the international students compared to an environment in which they formed a minority group.

The most active participant group was the Cypriot students, for several possible reasons. First, they showed more fluency in English writing skills than the other international students (although there was an exception). Cyprus is a member of the Commonwealth of Nations and uses English as one of its three official languages (together with Greek and Turkish). There is more possibility that the Cypriot students had been exposed to English, and thus, had greater English fluency than other international students might have had. In Yildiz and Bichelmeyer's study (2003), international students wrote shorter and simpler messages than native speakers of English. This result seemed to be influenced by the students' national background. In Yildiz and Bichelmeyer's study, the international students were mostly Chinese in origin. The international students' participation pattern in Yildiz and Bichelmeyer's study is similar to the East Asian (Taiwan and South Korean) students' participation pattern in the present study in that they posted shorter and simpler messages. Second, the members of the Cypriot sub-group were also full-time students, and therefore had more available time than the part-time UK students. Third, influenced by Western culture, their learning process was already accustomed to discussion and participation; this contrasts with that of the East Asian students, who were not familiar with discussion in class. Researchers maintain that Western students have a different learning style or learning culture from students with East Asian cultural background (Tucker, 2003; Liang and McQueen, 1999; Tweed and Lehman, 2002). The latter may be more used to teacher-directed learning, with less speech in class from them. Fourth, they seemed to have a great deal of knowledge and experience relevant to the discussion topics. Last, they were the largest sub-group (4 members) of all the national groups and the resulting solidarity may have made them more comfortable in the discussion.

The students' perceptions mostly indicated that the asynchronous online discussion was

helpful to their learning. The qualitative data from the online focus group and the quantitative data from the questionnaire converged on its learning merits that asynchronous online discussion was helpful to developing critical thinking skills, communication skills (English writing skills) and social community building and giving more learning opportunity from peers who had diverse personal experiences and cultural backgrounds. Therefore, the integration of asynchronous online discussion into face-to-face session was perceived positively by most students.

However, there were differences in perception between the native UK students and the international students. The latter perceived the asynchronous online discussion more positively than did the native British students in this blended mode course. Although asynchronous, written mode discussion requires more time and effort in communication, most of the international students did not agree with the questionnaire statement that asynchronous, written mode discussions were *'time-consuming and ineffective'*. Rather, the asynchronous, written mode discussion was perceived positively because it provided an opportunity for them to have more comfortable and confident participation, more thoughtful and critical thinking opportunities and practicing writing English on academic topics. However, the 3 native British students showed a mixed attitude to the effectiveness of online discussion. As time-constrained part-time students, they seemed to prefer the speed and convenience of face-to-face discussion. This implies that when integrating asynchronous online discussion into native speakers' campus-based courses, only a clear purpose and value in the students' view will attract them to it.

Student participation was not active and often quite delayed, except in seminar 2 (the first formal seminar). Although students were asked to post two messages per discussion, they

did not meet the requirement strictly. Rather, they participated more flexibly. Perhaps this was influenced by the fact that participation was not assessed. However, the quality of the messages was generally high. The students also evaluated the quality of discussion compared to the quantity of their participation. According to Murphy and Coleman (2004), when students are required to participate a certain number of times for grade, they are likely to engage superficially with the discussion by posting valueless messages merely to meet the requirements for the grade. A student's comment in the online focus group confirmed this: *"If my participation of online discussion influences my final grade, I will attend every week but post something not important"*. Requiring a certain number of messages to facilitate discussion is rendered suspect, because it can hinder authentic discussion. For the mature students who study graduate course, in particular, it would be better to stimulate the intrinsic motivation to participate rather than to insist on specific number of messages from each student.

Overall, students participated in an interactive way by referring to or building on peers' ideas. There was a similar number of positive (agreement) and critical comments. Comment was substantiated with justification or elaboration. This can be interpreted as an intention to negotiate meaning with peers by confirming and enriching understanding or repairing initial ideas. However, the discussion did not move to a deeper level because comment was given one-way and there was no counter-comment from the first participant. Due to the lack of response and absence of social context cues, it was difficult to identify whether students constructed a genuinely shared understanding.

Contextual conditions seemed to influence students' participation and interaction patterns

Course design: although the online seminar was not related to assessment, it did not remain a completely voluntary activity. The module tutor set the discussion structure: discussion topic, discussion period, deadline, required number of message posting, netiquette, so on. The module tutor and online discussion facilitator also participated in the online seminar. These discussion structures seemed to influence students' participation positively by giving the impression that the online discussion was an important component of the module. However, no assessment of online seminar participation seemed to influence students' motivation to participate negatively: they did not meet strictly the asked number of message postings.

Students' characteristics: individual students' English writing skills, knowledge level about the discussion topics and available time seemed to influence participation. For the international students, English writing skill was a critical determinant of their participation level, although the asynchronous trait lowered the communication barrier. For the part-time native UK students, lack of time was perceived as the main barrier to active participation. Students' knowledge level about the discussion topics also influenced participation. As graduate students, most of them had prior teaching and learning experiences which were the basic sources of their contribution. In particular, the students had diverse national backgrounds, which gave added value to their learning from peers about their teaching and learning experiences in their home country. In general, students who had more knowledge and experience relevant to discussion topics participated actively and posted valuable messages.

Technology characteristics: in face-to-face oral discussion, it is difficult to remember someone else's spoken ideas completely, due to limited memory capacity and lack of English listening skills (for international students in particular). This can limit the participation of the international students, who find it hard to keep up with the discussion. However, in the asynchronous online discussion, students' expressed ideas are archived in their exact form and can be reviewed repeatedly to aid comprehension. This facilitated more thoughtful and high quality message posting. At the same time, however, this archive trait limited participation. When students find their intended ideas are already posted by another student, they do not post the same ideas to avoid redundant contributions (67% agreed). In large discussion groups of 12 students in this case, not many unique and original ideas are left for later participants to contribute.

What I learned from the asynchronous online focus group: merits and limitations

In this case study, the asynchronous online focus group was used for qualitative data on students' perceptions. It revealed some merits and limitations for data collection. The merits experienced were as follows:

First, most of the international students could have a more equal chance to be heard in the online focus group and consequently, the collected data could be more balanced in opinion from the input of students with such diverse national backgrounds. Second, I could collect data more conveniently and efficiently. The asynchronous online discussion tool provided archived automatic transcription of the full version of group discussions without loss. Moreover, participants responded to the discussion topics, identifying themselves and using well organized sentences, so it was easy to read and capture their main ideas and identify who said what from the transcribed data.

However, it had some limitations for rich data collection.

First, as usual, there was a lack of active participation in the asynchronous online focus group. I intended to post probing questions as the discussion proceeded. However, it was not practical to do this because most students posted their ideas only once and rarely returned to the discussion board again; 12 messages in total were sent by 11 students. Only 1 student responded to both the initial discussion topic and the follow-up topic. To the first follow-up question, only 1 student responded. To the second follow-up question, two students responded. It was challenging to find ways to attract the participants to the subsequent probing questions. When the participants did not show up in the discussion space again, as moderator I could not move the discussion to a deeper level.

Second, there was a different type of group dynamic which influenced the collected data. When several topics were posted together, only one or two topics which were dealt with by the first participant were spotlighted by the others, leaving the other questions unexplored. Therefore, it is critical for successful management to find how to introduce discussion topics in asynchronous focus group discussions. Introducing all the topics at the beginning resulted in some topics not being discussed, whereas introducing topics step-by-step has the risk of participants' not showing up a second time in the discussion space again, making a failure in data collection.

CHAPTER 6

ASYNCHRONOUS ONLINE DISCUSSION IN SOUTH KOREA

6.1. Introduction

This case study was conducted on an asynchronous online discussion in a South Korean online distance course. The research questions include:

- How do online distance learners participate in asynchronous online discussion?
- Do students' interaction patterns in asynchronous online discussion evidence the indicatives of collaborative behaviours including: sharing opinions and information, negotiating different perspectives through explanation/elaboration/clarification to reach shared understanding, and socio-affectively supporting each other's effort?
- Does the asynchronous online discussions benefit learning, in the opinion of online distance students? If so, what are the perceived learning benefits of asynchronous online discussion?
- What are the perceived merits and limitations of asynchronous online discussion for supporting learning and collaboration in this context?
- What contextual factors affect students' participation in asynchronous online discussion?

6.2. The module

This case study was conducted on a postgraduate distance learning course in South Korea in 2007. The module title was 'Introduction to e-learning'. It was a first and compulsory module for the graduate course. The module was delivered through 13 online sessions and 2 face-to-face sessions. According to the module guidance, the purpose of the module was to introduce the role of e-learning in digitalized knowledge society and various teaching and learning models for e-learning. The module incorporated various teaching-learning models: audio-lectures by five team-lecturers, asynchronous online discussion, a student's online presentation and a group project using synchronous online discussion.

Every Tuesday morning at 9 am, a new online lecture was uploaded on the course web site. At the beginning of each online lecture, a short video clip was inserted in which the tutor introduced the outline of each session. Normal weekly learning activity included listening to audio-lectures presented with PPT lecture notes and participating in weekly asynchronous online discussion. Also, depending on the weekly base, another learning activity was added.

The module assessment criteria were composed of various elements: the online learning progress rate which assesses students' listening to the audio-lecture and online discussion participation (20%), off-line session participation (5%), an individual reflection diary (10%), group reflection diary (10%), psychological discussion (15%), mind map (10%) and portfolio (30%).

The module provided various social and cognitive interaction opportunities among students or between students and tutors. There were 7 bulletin boards in the course website.

<Table 6.1> Discussion boards and participation

<i>The title of discussion board</i>	<i>Purpose</i>	<i>Participants</i>	<i>The number of posted messages</i>
<i>Let's think</i>	Weekly asynchronous discussion for course content-related discussion topics	Students	199 messages
<i>Learning Q &A</i>	Asking questions about course assignments	Students, teaching assistant	81 messages
<i>Notice board</i>	Administrative notice for assignments, schedule	Tutor, teaching assistant	18 message
<i>Resource data room</i>	Provision of teaching resources	Teaching assistant	3 messages
<i>Between ourselves</i>	Sharing learning resources	Students, tutor	28 messages
<i>Introduce yourself</i>	Self introduction, social interaction	Students, tutor	22 messages
<i>Let's talk freely</i>	Social interaction	Students, tutor	29 messages

'Let's think' was the space for the weekly asynchronous online discussion, which is the main focus of this research. The other bulletin boards were 'Introduce yourself', 'Let's talk freely', 'Learning Q &A', 'Notice board', 'Resource room' and 'Between ourselves'.

'Introduce yourself' and 'Let's talk freely' were intended for social community building by providing the opportunity to share personal information and social interaction. Much research recommends providing opportunities for student introductions to break the ice at

the beginning of a course. The exchange of personal information, humour, or joking can reduce psychological barriers and the feeling of isolation among distance learners, and in this way, can contribute to building feelings of familiarity and group cohesion (Shamp, 1991; Benfield, 2002).

‘Notice board’ and ‘Learning Q &A’ were used for administrative purposes and curriculum related questions and answers. Just before this semester, the university had changed VLEs, therefore, several system problems occurred at the beginning of the semester. Many students posted queries about system errors on the Q&A board, in particular about confirming their online learning progress rate: when students listened to each week’s audio lecture, the system confirmed the students’ progress rate. However, this didn’t always work properly. Because the progress rate was related to the assessment, students were very nervous about the system failure. After a month, however, the system problem seemed to have settled down and be working properly.

The ‘Resource room’ and ‘Between ourselves’ were used for sharing learning resources among students and tutors.

Students were enthusiastic over sharing learning resources and making friendly relationships. Sometimes, the leading module tutor participated and encouraged students’ interaction with witty, humorous responses, acting as a model to show how to respond and interact with others in the discussion boards. The online teaching assistant responded promptly to resolve the problems raised by the students regarding the system problems or other assignment related queries. The individual bulletin board’s purpose, participants and participation rates are shown in the following table.

The weekly asynchronous online discussion: Let's think

The title of weekly asynchronous online discussion board was 'Let's think', which was the main focus of this research. Twelve online discussions were held during the 15 week semester. Each online lecturer who was in charge of a session posted one or two discussion topics relating to the weekly course content. There was no specific discussion structure or requirement of students to participate. The related guidelines were three assessment criteria: that participation in the online discussion partly counted for the online learning progress rate together with listening to the audio-lecture (total 20% of the final grade); that the posted messages could be used as a resource for final portfolio assignment (30%); and that only the messages posted during the discussion period (from Tuesday to next Monday) could be counted for the assessment.

The leading tutor said that she adopted weekly asynchronous online discussion with two purposes: to relieve students' final assignment burden (considering the adult distant learners' busy schedule) and to improve students' higher order thinking ability.

"...At first, I started weekly online discussion for the intention of relieving students' final assignment burden. If students participate in weekly online discussion regularly, then, their final assignment burden of portfolio would be diminished because they can use their posted messages as a resource for portfolio. Another intention was to avoid the weakness of our education, rote memory, and to enhance thinking abilities ..."(in leading tutor interview)

Student participants

Twenty students were enrolled in this module. Eighteen students were females and two

students were males. According to the questionnaire response (returned by 18 students), the majority of students were quite mature: only 1 student was 21~26 and the other 17 students were older than 27 years (9 students were even over 39 years old). The students were mostly adult learners who worked as school teachers, tutors in private academic institutions, administrative staff in universities or e-learning related areas (data from the 'Introduce yourself' bulletin board). Thirteen students (72%) responded that they had no previous experience of online discussion.

6.3. Data collection methods

At the beginning of the module, an informed consent form was posted on the bulletin board ('Notice board') with the help of the module tutor. All 20 students submitted their informed consent forms via e-mail to me or the module teaching assistant. The data were collected from the course web site, synchronous online focus groups, questionnaires, virtual observation and interview with the leading tutor.

Online documentation: at the end of the module, all the posted messages on the 'Let's think' discussion board and other bulletin boards, information about module assignments, assessment and lecture notes were retrieved from the course website in their university VLE.

Synchronous online focus groups: one of the module assignments included writing a group reflection diary. It was a small group task using synchronous online discussion and counted for 10% of the final grade. With the help of the module tutor, I was able to use the assignment for my data collection tool by changing the discussion topics according to my research questions (see Appendix 6-2). Therefore, the reflection groups were transformed

into online focus groups. Because of the change in the university VLE system, the synchronous online discussion tool embedded in the VLE had some problems with a stable network connection. So, students were given the choice to select any online chat tool either the online chat programs embedded in the university VLE or any other commercial chatting programs such as MSN or Nate on (a Korean ISP's online chat program).

Seven online focus groups (2-3 members) were formed by the tutor. The tutor appointed a student in each group as a discussion moderator. Thus, the synchronous online focus group was conducted autonomously by the students. Every group had previous experience, as the same group, of synchronous online discussion, so, group members felt more familiar with each other and with synchronous online discussion. Students developed effective synchronous online discussion methods. For example, a group shared ideas using the bulletin board embedded in the VLE before the focus group discussion to avoid off-track discussion. Also, students used different font colours to distinguish each other easily. According to the groups, the discussion time was one hour and 30 minutes to two hours. A group held three online focus group sessions when they found a deficiency in their discussion.

Questionnaires: the questionnaire used in the UK context was translated into Korean and pre-tested by the leading module tutor in Korea. It was distributed by three methods. First, it was posted on the 'Notice board' of the course website at the beginning of the final session week. Second, it was emailed privately to some students whose email addresses were known to me because they had emailed me back their informed consent form. However, the response rate was low: only 7 students returned them. Finally, therefore, I participated in the final classroom session in South Korea and distributed the

questionnaires. This brought the final response rate to 18 out of 20 students (90%).

Tutor interview: this interview was conducted after the module ended (June, 2007). The leading module tutor and I met in her office. The interview continued for almost one hour. The interview schedule included the purpose of adopting asynchronous online discussion, the tutor's evaluation of student online discussion, tutor's role, effective ways of ensuring active student participation and e-learning strategies in the university (See Appendix 5-2).

6.4. Findings

6.4.1. Students' participation in the asynchronous online discussion

Summary of students' participation

In total 199 messages were posted by 20 enrolled students during the 12 asynchronous online discussions. On average, 13 students participated, 16.6 messages were posted, and each student posted an average of 1.2 messages per discussion.

As the students settled down in the online discussion environment, student participation increased. There were 9 messages in the first week, reaching a peak in the week 4 discussion with 31 messages and maintained above 16 messages from week 2 ~ week 9. However, students' participation declined (11→6→9→9) during the last few discussions (week 11~week 14). There was a small group project using synchronous online discussion in week 7 and face-to-face sessions in week 10 and week 15, therefore, there was no asynchronous online discussion in these three weeks. There were two reply functions in the VLE: the usual 'Re' message and 'short comment' function. Students used 'Re' for longer replies and 'short comment' function for 1~3 line responses

<Table 6.2> Summary of asynchronous online discussion participation

<i>Week</i>	<i>Number of participants</i>	<i>Number of messages</i>	<i>Average number of message per student</i>	<i>Number of short comment</i>
<i>1</i>	9	9	1	3
<i>2</i>	16	16	1	3
<i>3</i>	17	21	1.2	4
<i>4</i>	18	31	1.7	2
<i>5</i>	19	25	1.3	4
<i>6</i>	14	19	1.4	3
<i>8</i>	14	17	1.2	10
<i>9</i>	14	25	1.8	21
<i>11</i>	11	11	1	2
<i>12</i>	6	7	1.2	
<i>13</i>	9	9	1	2
<i>14</i>	9	9	1	
<i>Average</i>	13	16.6	1.2	4.5

Although on average 13 students (out of 20 enrolled, 65%) participated in each online discussion, there was a difference in the individual students' participation levels. The most active participant posted total 22 messages, whereas one student did not post any message during 12 online discussions.

<Table 6.3> The number of individual students' messages

<i>The number of messages</i>	<i>0~5</i>	<i>6~10</i>	<i>11~15</i>	<i>More than 16</i>
<i>The number of students</i>	3	6	10	1 (22 messages)

The characteristic of the most active participant and the least participant

The most active participant posted total 22 messages. She was in the younger age group and described herself as an introvert person who was reluctant to talk to strangers in face-to-face situations. Yet she participated here in an interactive way. She balanced posting her own opinions to the topic and responding to peers' messages. Among the 22 messages, 12 messages (55%) were responses to peers' messages. She also received many responses from others. So, she was frequently found in the middle of group interaction.

She acted as a community builder in this online discussion. She wrote comparatively short messages in a conversational style which contained self-disclosing statements (presenting details of personal information or vulnerability), jokes, encouragement of her peers, and together, looked friendly, witty and interesting. Also, she used various text editing skills, such as various fonts, font colours, font sizes, tables, emoticons. This contrasts with the

other students' literal and formal writing style and monotone and formal approach to text editing.

The following is a quotation from her personal reflection diary (one of the assignments) which was posted by the tutor as a good example on the 'Between ourselves' bulletin board. She said that peers' positive feedback motivated her highly, so, she also tried to respond actively to peers' messages. Through this process, she realized that it was herself who got most from active participation process.

"I could expand my thought by contacting with different opinions from peers. I had motivating and worthwhile feeling when peers responded to my messages, irrespective of positive or negative, therefore, I thought others would feel similarly when I respond..., I tried to help and collaborate with peers, however, actually, I realized that it was myself who get the most from the community activity. The uploaded high quality resources by peer students stimulated me and made me more enthusiastic about learning..."

The two male students participated least: one posted 5 messages and the other did not post any. In this case, they were in the minority (there were 18 female students) and this may have influenced their low participation.

The causes of the non-participant student's silence can be identified from the personal reflection diary. His extremely busy schedule was the main cause. He was taking two modules in the graduate school, had to take at least one e-learning module as a requirement in his work place. Moreover, he was already taking part in a project in his work place as the graduate course started. So, he had time to listen to the online lectures only early in the morning at the weekend. He described his exhausting life like this:

“I could listen to the online lectures at dawn of weekends. So, I found myself asleep in the middle of listening to the lectures. So, frequently I had to listen again...” (in personal reflection diary, student K)

Although he was extremely busy, he said that he tried to log on to the module site at least once per day and to read the posted messages in the discussion board.

A noteworthy point is that status differentiation seemed to emerge among the students. There were some students whose messages were read more and responded to more by peers (the VLE had the function of counting the number of hits, indicating how many students read each message). Generally, these were the early participants in each discussion, therefore, there was more possibility of their being read and responded to by peers than if they had contributed later. They seemed to have more knowledge, higher learning motivation and more effective time-management skills.

The depth of threads

As stated, students could respond using ‘Re’ message or ‘short comment’ function. At first, students used the ‘Re’ message more; later, they increased the use of the ‘short comment’ function. By using this latter, students could respond more promptly and easily. At the beginning (weeks 1~3) and in the later discussions (weeks 12~14), level 1 and level 2 occupied 83% ~ 100%. During the middle part of the semester, weeks 4~9, threads with more than level 3 increased, although there was some fluctuation in individual weeks.

As students got to know each other better (in parallel with this asynchronous discussion, students introduced themselves on the ‘Introduce myself’ bulletin board in the first month), they would feel more friendly to each other. Accordingly, they wanted to respond to each

other’s messages. However, the familiarity with online discussion and peer students did not seem to guarantee more participation and interaction, as seen in the weeks 11, 13, 14. The difficulty of discussion topic and competing demands from other final assignments seemed to distract students from participating. In the following statistics, the depth of thread includes both normal ‘Re’ messages and short comments.

<Table 6.4> The depth of thread

<i>Week</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>8</i>	<i>9</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>
<i>Level 1</i> (1)	3 (50%)	7 (58%)	13 (76%)	4 (31%)	8 (62%)	8 (67%)	2 (25%)	2 (20%)	2 (50%)	1 (25%)	7 (78%)	9(100%)
<i>Level 2</i> (2)	3 (50%)	3 (25%)	2 (12%)	2 (15%)		1 (8%)	3 (38%)	1 (10%)		3 (75%)	2 (22%)	
<i>(1)+(2)</i> ()	100%	83%	88%	46%	62%	75%	63%	30%	50%	100%	100%	100%
<i>Level 3</i> (3)		2 (17%)	1 (6%)		2 (15%)	1 (8%)						
<i>More than level 4</i> (4)			1 (6%)	5 (54%)	3 (23%)	2 (17%)	3 (38%)	7 (70%)	2 (50%)			
<i>(3)+(4)</i> ()		17%	12%	54%	37%	25%	38%	70%	50%			

As a whole, monologue type messages (level 1) occupied 56%. Level 1 and level 2 occupied 73%. This means that most messages were monologue type messages or

messages with only one response. In addition, the messages responding to the discussion topics were much longer than the response messages to peers.

<Table 6.5> Summary of depth of thread

<i>Level 1</i>	<i>Level 2</i>	<i>Level 3</i>	<i>More than level 4</i>
66 (56%)	20 (17%)	9 (8%)	22 (19%)

6.4.2. Students' collaboration patterns in the asynchronous online discussion

For a detailed analysis of the students' collaboration pattern, three characteristic discussions were selected: week 4, week 6 and week 9. The week 4 and week 9 discussions were selected because students participated in a more interactive way than in other weeks. Week 6 was chosen because the rate of isolated messages was highest (67%) than in other discussions during the mid-semester discussions. Moreover, the three weeks had different kinds of discussion topic. Week 4's discussion topic encouraged social exchanges, week 6's topic was more theory-related and required higher-order thinking skills, and week 9's topic was more practice-related. Comparison of the three discussions may provide some insight into the influence of the discussion topic on students' participation and interaction patterns in asynchronous online discussion.

Content analysis result

First, overall, the students' discussion was not interactive. When reading the discussion transcripts, I found that students engaged more in responding to the tutor's discussion topics than in discussing with peers.

<Table 6.6> Content analysis result

<i>Categories</i>	<i>Sub-categories</i>	<i>Week 4</i>	<i>Week 6</i>	<i>Week 9</i>
<i>Idea generation</i>	<i>Opinions</i>	11	12	11
	<i>New issues</i>			
	<i>Inquiry</i>	3		
	<i>Total</i>	14	12	11
<i>Idea linking</i>	<i>Agreement</i>	1	3	22
	<i>Critical comment</i>		1	4
	<i>Sharing information</i>	7		5
	<i>Social statements</i>	8	4	5
	<i>Total</i>	16	8	36
<i>Intellectual convergence</i>	<i>Shared understanding /common position</i>	1	2	4
	<i>Integration of different perspectives</i>			
	<i>Enhanced understanding</i>	1		1
	<i>Tutor's overall feedback</i>			

There was a difference in the length of message between the initial message responding to the discussion topics and the messages responding to peers' messages. The length of message is an indicator of students' engagement level because long messages reflect more time and effort. The average word length of an initial message vs. a response message was: 163 vs. 106 in week 4, 272 vs. 81 in week 6 and 272 vs. 89 in week 9.

When simply comparing the number of messages between idea generating and idea linking, there was an almost similar number in the week 4 discussion (14 vs. 16), but fewer idea linking messages in week 6 discussion (12 vs.8). Only week 9 discussion had more idea linking messages than idea generating messages (11 vs. 36). In addition, the active idea linking statement in week 9 was made possible by the use of the 'short comment' function which is composed of a 1-3 line short response. This discussion patterns implied that students gave priority to responding to the tutor's questions and not to interacting with peers.

Second, in the idea generation stage, most of the students' initial messages were responding to the tutor's discussion topics. Students did not initiate a new threaded discussion by raising a new issue. This indicated the importance of tutor posted discussion topics in students' discussion and learning. Or, this can be interpreted as the students' taking a passive role as respondents to the tutor's questions rather than actively using the potential of online discussion for their learning. However, it should be considered that students actively shared learning resources and opinions in other discussion boards.

Third, the discussion topic influenced students' interaction pattern and the types of idea exchanged. When the discussion topic was related to students' experiences, messages included diverse opinions and experiences and response messages included substantial

comment. When students lacked knowledge and experience relevant to the topic, they reproduced what they had learned from the tutor through online lectures, so, their messages lacked diversity. In this case, the responses (when there were any) were rare and superficial.

In the week 4 discussion, the discussion topic was: Introduce your role in relation to e-learning and list a problem in implementing the role. In this discussion, the main collaborative behaviours were ‘opinions’ in the idea generation stage and ‘exchange of social statement’ and ‘providing information’ in the idea linking stage.

Student opinions included personal information (e.g., what they were doing, why they started this course) and their problems as e-learners or e-learning practitioners. They disclosed their personal feelings and problems frankly (e.g., personal concerns about how to coordinate study and other work as adult learners, effective e-learning tips, and the difficulty of participating in online discussion due to lack of writing skills). Students empathized with peers’ difficulties and encouraged each other by reflecting on their similar experiences, so, it was really heart-to-heart talk. Therefore, the majority of student responses were social statements such as empathy or encouragement.

Another frequently found statement was on sharing practice-based information and experiences. This was motivated by the latter part of the discussion topic: ‘list one problem experienced’. Some students described their problems and peers shared their personal or working experiences to help them.

The week 6 discussion topic was: Behaviourism and cognitive learning theory are useful learning theories for e-learning. If e-learning contents are developed by adopting either Behaviourism or cognitive learning theory, what problems would be expected? This topic

required students' clear understanding of the two learning theories and higher order thinking skills such as application and evaluation.

Korean students both in classroom and in e-learning are traditionally accustomed to a lecture-style teaching model with an instructor, based on Behaviourism. Therefore, they had little knowledge and practical experience of cognitive learning theory to reflect on when evaluating the problems of e-learning contents based on cognitive learning theory. So, students' messages in the idea generation stage were a summary of what they learned from the online lectures, lacking individuality or diversity in their content. Due to the lack of knowledge and confidence that they had understood, students rarely commented on a peer's opinions. When they gave feedback, they were mostly superficial, such as "*Vague theories became clear by your summary*" (student S)

There were two discussion topics in week 9: 1) Suggest an assessment strategy which will be effective or ineffective when applied to the current module, 2) If you have student subjects, think about an effective or ineffective assessment strategy to apply to them.

A peculiar characteristic in this discussion was that student discussion was interactive and response messages predominantly agreed with peers' opinions (22 out of 36). The frequent use of the 'short comment' function embedded in the VLE made students' response easier and more frequent. When students responded to the discussion topics or a peer's opinions, they commonly reflected on their shared experiences in this module (online discussion, online group project, portfolio, etc). Students' shared experiences acted as common ground to reflect on, and led to (perhaps easily) to agreement.

Fourth, students' responses were mostly in agreement or social statements encouraging the

peers' contribution (such as praise or appreciation). So, critical comment was rarely found in the three discussions. Students' hesitation to be critical of peers' opinion was also expressed in the questionnaire response. 78% students agreed or strongly agreed with the statement 'I hesitated to challenge or to be critical of peers' opinion in online discussion'. In general, it was easier to express agreement than disagreement. Students may get more confidence in their opinions when they find similar opinions from others; therefore, they can more easily express an agreeing response. In contrast, when finding different opinions, they would be uncertain of their own opinions and therefore less likely to express it explicitly. Moreover, critical comment is more cognitively demanding because it ought to be supported with valid reason and knowledge. Expression of agreement may have both a cognitive and a social effect. Cognitively, it means a shared understanding between students on the issues discussed. Socio-affectively, exchanging positive comments contributes to social community building. By receiving agreement or praise, the student being responded to would feel more positively toward the responding student and get the motivation and courage to participate more actively in the discussion. When there is no feedback or negative feedback on expressed opinions, participants would feel their contribution is not valued by others, and would lose the motivation to participate (Stacey et al., 2004).

Although exchanging critical comment is important to the learning process, students would be reluctant to express it because of the risk to the relationship and because it might cause conflict or negative feelings, in particular when full mutual trust has not been built. When group members build trust each other, they will be more likely to accept stated disagreement or critical comment at face value and less likely to misinterpret it as a personal attack. This is evidenced by the increasing number of critical comments in the

later discussion (in week 9) but not the early discussions (in weeks 4 and 6).

Fifth, the indicators of idea convergence were found in long threads. These point to a shared understanding between students when they came across their peers' similar opinions or an enhanced understanding by contacting with peers' diverse opinions and information. This is related to more agreement and sharing information in the idea linking stage. There was no resolving of conflicting perspectives.

6.4.3. Students' perception of the asynchronous online discussion experience

In the following, students' perceptions of learning merits, limitations and barriers to online discussion participation are presented. The qualitative data from synchronous online focus groups and quantitative data from questionnaires are presented together.

6.4.3.1. Students' evaluation of the asynchronous online discussion experience

Overall, students' perceptions of asynchronous online discussion experience were highly positive. Almost all the students agreed or strongly agreed with the statements: 'Online discussion was helpful to my learning' (18 students, 100%), 'I enjoyed online discussion' (17 students, 95%) and 'The integration of online discussion enhanced the quality of this module' (17 students, 95%). Almost 70% of students evaluated positively the quality of online discussion (12 students, 67%) and level of participation in discussion (13 students, 72%).

<Table 6.7> Students' evaluation of their online discussion experience, N=18

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>Online discussion was helpful to my learning</i>	9 (50%)	9 (50%)		
<i>I enjoyed online discussion</i>	7 (39%)	10 (56%)	1 (6%)	
<i>The integration of online discussion enhanced the quality of this module</i>	2 (11%)	15 (83%)	1 (6%)	
<i>I was happy with the quality of online discussion</i>	2 (11%)	10 (56%)	5 (28%)	1 (6%)
<i>Everyone participated actively in online discussion</i>	4 (22%)	9 (50%)	5 (28%)	

6.4.3.2. Students' learning from asynchronous online discussion

Diverse perspectives and comprehensive thinking

One of the most often mentioned merit of discussion was to see the topic from multiple and comprehensive perspectives by exchanging views with their peers. These are some quotations from the online focus group discussion.

"...there were really diverse ideas..."(group3)

“It was a time to repair my wrong knowledge and refine my own thinking...” (group 2)

“... overcome the limitation of my own thinking, therefore, I could see from diverse perspectives” (group 2)

“...expand the width of thinking by reading various perspectives on discussion topic” (group 7)

“...I could promote comprehensive thinking...” (group 3)

Student responses in the questionnaire indicated that asynchronous online discussion was helpful to developing critical thinking skills. Most of students agreed or strongly agreed with the statements ‘Writing messages helped me to develop critical thinking’ (78%) and ‘Reading others’ messages helped me to develop critical thinking’ (89%).

Communication skills

Twelve online discussions were held in this module. So, if students participate actively and continuously, there is a fair likelihood of improving written communication skills. Students’ accounts indicated improvement in communication skills and writing skills in particular.

“Through online discussion, writing skill has improved” (group 4)

“I could learn to select suitable words for discussion topic” (group 5)

“I could learn how to listen to other’s opinions, how to express my opinion” (group 1)

In the questionnaire response, a majority of students (14 students, 78%) agreed or strongly agreed on ‘Participation in online discussion improved my writing skills’

Building the sense of community among online distance learners

Online distant learners are likely to be isolated from peer students and instructors. The feeling of isolation causes various negative effects on student learning. Wegerif (1998) contends that individual success or failure in an online course depends on the extent of feeling of community. In general, the sense of community involves trust and comfort between participants. As a student revealed in the earlier discussion, isolated and lonely distance learners are likely to suffer from lowered learning motivation.

“I feel my learning motivation is lowered because there is no sense of unity among learners...I became passive ...”(student J, in week 4 discussion)

Students could overcome the initial loneliness and feel close to their peers as the online discussion progressed. They could get the motivation and stimulus to study hard from observing peers’ enthusiastic attitude and from receiving positive and encouraging responses.

“Through online discussion, I could feel that I was not studying alone. Also, interest and curiosity toward peer students increased. By observing peer students’ enthusiastic attitudes, I could get motivation to study harder. Online discussion created a bond between me and my peers” (group 1)

“...Conversing through online discussion makes more close feeling with peers when we meet in face to face meeting...” (group 6)

As mentioned in the above module description, the module provided diverse interaction opportunities in addition to the weekly asynchronous online discussions: the other 6

bulletin boards, a small group project using synchronous online discussion in week 7 and a face-to-face session in week 10. These online and off-line interaction opportunities promoted students' cohesiveness as members of a learning community.

In the questionnaire response, all the students (18 students, 100%) agreed with the statement 'Online discussion promoted a sense of community with peer students'.

Active and deep learning about topics

The asynchronous written discussion provided active and deep learning opportunities because it gave students sufficient time for self-directed learning and in-depth thinking. A student described her preparation process like this:

"Searching for resources relating to discussion topics, understanding, and formulating my own thought. Through this process, much deeper learning was possible. If there was no online discussion, my learning activity would be limited to listening to audio-lectures only" (group 1).

"...could improve self-directed learning attitude...and active attitude to problem solving"(group 3)

The writing process help students to organize their own opinions carefully and clearly: *"clearer in thinking and more careful in expression"* and *"...could organize my initial, rough thought by writing message..." (group 3)*

In the questionnaire, 72% (13 students) agreed or strongly agreed with the statement 'asynchronous online discussion facilitated deeper learning than face-to-face discussion'.

Other learning merits mentioned in online focus groups

- Time-management skill (group 5),
- ICT skill improvement(group 3): in the questionnaire response, 50% (9 students) confirmed ICT skill development

<Table 6.8> Learning merits of asynchronous online discussion, N=18

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>Writing messages helped me to develop critical thinking</i>	5 (28%)	9 (50%)	4 (22%)	
<i>Reading others' messages helped me to develop my critical thinking</i>	5 (28%)	11 (61%)	2 (11%)	
<i>Online discussion promoted a sense of community with peer students</i>	8 (44%)	10 (56%)		
<i>Participation in online discussion improved my writing skills</i>	3 (17%)	11 (61%)	4 (22%)	
<i>Online discussion enhanced my IT skills</i>	1 (6%)	8 (44%)	9 (50%)	
<i>Online discussion facilitated deeper learning than face-to-face discussion</i>	5 (28%)	8 (44%)	5 (28%)	

6.4.3.3. Perceived merits and limitations of asynchronous online discussion

Merits

More comfortable participation opportunity, especially for introvert students

Six focus groups (out of 7) all mentioned that asynchronous online discussion provided more comfortable and equitable participation opportunities, for introvert students or those who are poor at speaking in particular. These merits seemed to contribute to more equal and wider participation.

“Online discussion provides equal participation opportunity. Especially, students who are lack of confidence in verbal communication or introvert students can express their ideas actively” (group 1)

“Introvert students or shy students can participate actively in online discussion because they can be freed from the psychological pressure” (group 5)

In the questionnaire response, a majority of students agreed or strongly agreed with the statement ‘I felt comfortable to express my ideas in online discussion’ (13 students, 73%).

Overcoming time and space: for the online distance learners, overcoming time and space barrier was a real value. Four focus groups mentioned this merit (group1, 3, 5, 7)

Cognitive aid for later review: group 1, 4,5

“Discussion is archived, so, can review later” (group 5)

Perceived limitations

Lack of effective communication due to lacking social context cues

In general, online communication is referred to as a lean medium due to the lack of social context cues to support communication. For the online distance learners who met each other for the first time in this module, the lack of non-verbal social context cues (such as facial expressions, gestures, tones of voice) hindered effective communication. Five focus groups mentioned this weakness. According to the students, lack of social context cues obstructed the exact understanding of meaning and nuance in other people's messages.

"...online discussion has limitation compared to the face-to-face discussion. People can obtain various clues from the facial expression and gestures in face-to-face situation, however, it is difficult to get enough clues for communication in text-based online discussion..." (group 1)

"...it needs the ability to catch the mood from the text..." (group 2)

As a student stated, *"online discussion ability depends on writing skill"* (group 1). A lack of social context cues together with deficient writing skills limited effective discussion. In their fear of being misunderstood, students tended to be more cautious in expressing their ideas. This kind of difficulty is also reported in Stacey's research (2004) in which some students expressed the difficulties of discerning the flavour of replies and the possibility of misinterpreting or being misinterpreted in the intent of their messages due to the absence of social cues.

"Because we can not meet together in face-to-face, detailed discussion is difficult..."

(group 3)

“It’s difficult to express my ideas fully in writing, so, become more cautious in expression because it’s difficult to identify how my ideas are accepted by others” (group 7)

Students perceived that affective feeling exchange and rapport formation was particularly difficult, due to the lack of social context cues. So, some students felt online discussion was less humanistic and more aggressive than face-to-face discussion. This perception is similar to Sproull and Kiesler’s (1986) contention that CMC has limitations for socio-affective communication due to the lack of social context cues.

“Something should be communicated with facial expression and gestures, but only with text, I could not feel the humanistic aspect” (group 5)

“Because it is cyber space without voice and facial expression, only with text, there is aggressive feature in online discussion” (group 2)

“In some cases, I expressed only my own thought, therefore, rapport is lack” (group 3)

Lack of interaction and prompt feedback

In the asynchronous online discussion, getting prompt feedback or response is difficult because writing takes more time than speaking and participants access the discussion space asynchronously.

“It’s difficult to get immediate response or feedback in asynchronous online discussion, so, it hindered active interaction” (group 1)

“Because writing takes time, interaction is limited” (group 1)

In the responses to the questionnaire, students showed mixed attitudes to ‘Lack of prompt feedback disappointed me’ (50% agreed and 50% disagreed). Student response seemed to be linked to the number of responses they received.

Other limitations of asynchronous online discussion

“I can remain as an outsider without expressing my opinion” (group 4)

“It’s difficult to get consensus in asynchronous online discussion” (group 6)

“In off-line, being with same place makes concentration easier, whereas in online discussion where just watching screens hinders concentration” (group 4)

Asynchronous online discussion can be perceived as being inefficient in terms of time and ease of communication because of written and delayed communication. However, the students did not perceive this feature as a serious weakness. All the students disagreed with the statement ‘Asynchronous online discussion is time-consuming and ineffective’. Maybe, students perceived other learning merits which offset the time and effort needed for written communication.

<Table 6.9> Merits and limitations of online discussion, N=18

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>I felt comfortable to express my ideas in online discussion</i>	1 (6%)	12 (67%)	5 (28%)	
<i>Lack of prompt feedback disappointed me</i>	4 (22%)	5 (28%)	8 (44%)	1 (6%)
<i>I felt online discussion is time-consuming and ineffective</i>			13 (72%)	5 (28%)

6.4.3.4. Barriers to participation in asynchronous online discussion

Lack of knowledge about discussion topic

Students stated that easy topic facilitated active participation, whereas too broad and difficult topics hindered participation.

“When the discussion topic was easy, I could participate actively and discussion was felt interesting, however, the discussion topic was hard and difficult, I was reluctant to participate and less opinions were expressed, therefore, discussion was not interesting”
(group 4)

“Sometimes, I couldn’t understand the discussion topic...so, I thought over the discussion topic for a week, and barely managed to post my message, after that, I asked

to myself 'Is it right?' (group 6)

Students preferred practical topics relating to their work.

"Concrete and practical topics which are related to our work rather than comprehensive or broad topics" (group 2)

In the questionnaire response, a majority of students agreed with 'lack of knowledge about discussion topics' being a barrier to participation (13 students, 72%).

Lack of time

Lack of time is frequently referred to as a cause of low participation for distance learners (Bullen, 1998). Most of the students in this module were mature adult learners who had competing time demands from work, study and family commitments. Many students wrote about the difficulties of coordinating a busy schedule and study time. A student expressed her agony in choosing a priority between study and work:

"...I had conflict in my mind when I have to choose the priority between the study which myself chose and the work in company which has to be done immediately ..." (student K, in week 4 discussion)

Another student, a school teacher, worried about lack of study time;

"...every Tuesday, whenever new online lectures uploaded, I worried about if there would be no study time to search for resources or to prepare discussion. Usually, I have little time to listen to the online lecture during the weekdays, so, I can manage to listen to the online lecture on weekends ..." (student J in week 4 discussion)

Therefore, students' participation in the online discussion concentrated on weekends or the deadline for discussion (Monday).

In the questionnaire response, 67% (12 students) agreed that 'Lack of time hindered my participation in online discussion'.

Students' emotional burden to write high quality message

Students expressed their hesitance and concerns when posting messages. The archived feature of online discussion seemed to make students feel it an emotional burden to write high quality messages.

"...speaking can not be heard repeatedly if it's not recorded, but the messages posted on the discussion board can be read several times in detail until it is deleted. I think it is both of the merit and weakness for the writer. As passing several weeks, it looks like becoming easier, but still, I feel difficult to write..." (Student R, in week 4 discussion)

"Whenever I post my message, I worried about the quality of my writing...so, the frequency of posting diminished..." (group 3)

In an effort to make a useful contribution, students avoided posting similar ideas to those of others in the asynchronous online discussion.

"When I found peers' opinions similar to mine, I felt the motivation to participate weakened...I lost the proper time to participate because I have to find something unique" (student 4 in open question questionnaire)

In the questionnaire response, 62 % students agreed with 'I hesitated to post because of

concern that peers would evaluate the quality of my message' and 39% students agreed with 'Sometimes I gave up posting messages because peers posted similar opinions'

In this case study, most of students were mature students. Many of them had quite long experience as school teachers. Their changed role, from being assessors as teachers to being assessed as students, might make them feel a greater emotional burden in contributing messages of a high quality in order not to lose face.

Unfamiliarity with discussion and lack of writing skills

Conventionally, South Korean students are not accustomed to discussion in class. Students' unfamiliarity with discussion, in particular text mode discussion requiring writing skills, hindered their participation. A student expressed her embarrassment like this:

"...the online course which I took before needed only listening to the lecture from the beginning to the end without comment or reply. So, when I took this course, expressing my opinions in writing was a big challenge to me..." (student R, in week 4 discussion)

Another student also expressed her difficulty of writing messages:

"Because I am not familiar with discussion and interaction, I used to write and delete for 30 minutes when writing, and the next day, I tried to refine my thought again and after that, I posted" (student K, in week 4 discussion)

In the questionnaire response, 50% students agreed that 'lack of writing skills' formed a barrier and 61% students disagreed with the statement that they were 'familiar with group discussion through their education'.

<Table 6.10> Barriers to online discussion participation, N=18

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>Lack of knowledge about discussion topic hindered my participation</i>	2 (11%)	11 (61%)	4 (22%)	1 (6%)
<i>Lack of time hindered my participation in online discussion</i>		12 (67%)	5 (28%)	1 (6%)
<i>I hesitated to post in a concern that peers would evaluate the quality of my message</i>	1 (6%)	10 (56%)	5 (28%)	2 (11%)
<i>Sometimes I gave up posting messages because peers posted similar opinions</i>	1 (6%)	6 (33%)	10 (56%)	1 (6%)
<i>Lack of writing skills hindered my participation in online discussion</i>		9 (50%)	8 (44%)	1 (6%)
<i>Technical problem hindered my participation in online discussion</i>	3 (17%)	6 (33%)	7 (39%)	2 (11%)
<i>I prefer studying course materials to participating in online discussion</i>	2 (11%)	2 (11%)	13 (72%)	1 (6%)
<i>I am familiar with group discussion through my education</i>	1 (6%)	6 (33%)	9 (50%)	2 (11%)

6.4.4. Perspectives on tutor's role

6.4.4.1. The leading tutor's perspective

The leading tutor was an expert in e-learning. She had directed the distance school for years. She was awarded a PhD in e-learning in the USA. Therefore, her design for this module and her perspectives may have been influenced by both the USA and the traditional South Korean teaching and learning model. She said that she adopted a weekly asynchronous online discussion for two purposes: to relieve students' final assignment burden (considering the adult distant learners' busy schedule) and to improve students' higher order thinking ability. She evaluated her purposes as 100% achieved. Regarding the tutor's role, she said that the online instructor should give correct feedback on students' messages promptly and encourage the motivation of online distance learners, although she could not play these roles due to VLE system restriction (however, she participated in the other discussion boards and gave feedback to students' messages).

"...I think the tutor's role is to give prompt feedback, motivating, and correct feedback on the content of message. Especially, this module is the first module for the new students, so, I place emphasis on motivating students to take interest in e-learning class. So, assessment also emphasized participation rather than the quality of message...."(in tutor interview)

She said that the team lecturers gave this type of feedback until the last semester (before the new VLE was adopted). However, she admitted the practical difficulties of implementing these roles due to lack of time and no incentives.

"In fact, it is difficult to give feedback on individual student's message due to other work

burdens... I think no incentive is a problem...if some incentives are given, instructors would care more...such as counting more credit in case of online course, because it needs more time and effort of instructor's..."

Although she could not participate in the discussion, she intended to give feedback on the final portfolio assignment as a whole.

6.4.4.2. Students' perceptions of the tutor's role

In the questionnaire response, the majority of students expected 'the tutor to take an active role in the online discussion' (12 students, 67%) and 'more interaction with peers than the tutor in online discussion' (15 students, 83%).

<Table 6.11> Students' perception of tutor's role, N=18

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>I prefer the tutors to take active role in online discussion</i>	5 (28%)	7 (39%)	6 (33%)	
<i>I want more interaction with peers than the tutor in online discussion</i>	4 (22%)	11 (61%)	3 (17%)	

Students expressed diverse opinions about the tutor's role in the asynchronous online discussion. The most frequently stated role was that of discussion facilitator. The other expected roles were subject expert and motivator. However, other students wanted minimal intervention from the tutor and student-centred free discussion.

Discussion facilitator

In this online discussion, there was no moderator in the discussion process and no feedback at the end of discussion. Students expected the tutor to manage the discussion for productive discussion. Four focus groups mentioned this role. A student described the absence of the tutor in the discussion process as “*a big street without a traffic light*”. When there is no facilitation from the tutor, discussions are likely to result in superficial opinion exchanges without any conclusion.

“If there is no tutor’s feedback or facilitation, students would like to explore the discussion topic randomly and exchange superficial opinions without productive discussion. After that, students’ discussion would be transferred to another topic without synthesis or summarization...” (group 7)

Some students suggested that the tutor should provide overall guidelines in discussion or direct the discussion process to keep it on-track.

“Provide overall guideline and compensate for the immaturity of discussion” (group 2)

“When student’ opinions are biased toward one direction, the tutor should intervene and guide the discussion to the right direction by asking probe questions” (group 1)

Knowledge expert

The majority of students are new learners of an e-learning subject. So, they wanted the tutor to exhibit expert knowledge in order to supplement what they lacked by giving feedback on students’ opinions or introducing learning resources. Three focus groups mentioned this role.

“...make the discussion in–depth with expert knowledge” (group 3)

“...provides various resources and questions which can help to see the topic from different perspective” (group 1)

“...the tutor should inform students when there is wrong opinion or something to be supplemented...” (group 4)

Motivator

Some students expected tutor to have a motivating role: encouraging low participants and praising active participants. For the students, knowing whether or not the tutor read their messages was a motivator in itself.

“To low participants, the instructor should give suitable stimulus” (group 4)

“For the active participants, praising and encourage messages, and for the passive students, induce participation... ” (group 7)

“The tutor should give the belief that the she is reading students’ messages” (group 5)

However, some students were against a tutor’s having an active role

However, a third of students (33% in the questionnaire) expressed a negative view of the active intervention from the tutor. They thought that tutor’s active role could hinder the active role of the students and the free expression of opinions in the discussion process.

“If the instructor leads the discussion, students might be dragged in the discussion process...” (group 2)

“If the instructor intervenes too much, it will be difficult for students to express their opinions freely” (group 3)

“... can not express opinions freely in aware of the instructor” (group 4)

Therefore, they suggested minimal intervention on the tutor’s part.

“To make the atmosphere to discuss autonomously” (group 6)

“... moderate guidance is suitable”(group 3)

Some students suggested minimal ways in which tutors might intervene such as providing guidance at the beginning of discussion or overall feedback at the end of discussion:

“...at least, the tutor should participate and guide the discussion at the beginning of discussion” (group 2)

“...the tutor should give overall feedback at the end of discussion to inform what the core of discussion was... (group 5)

6.5. Summary and discussion

Students showed inclusive and democratic participation in the asynchronous online discussion. On average, 13 students (out of 20 enrolled) participated and each student posted 1.2 messages per discussion. However, the discussion was not interactive. Most of the messages (73%) were monologues or messages with 1 response, offering limited interactive and in-depth discussion. Students put more effort into articulating their opinions on the tutor’s discussion topics than on responding to or commenting on their peers’ ideas. Content analysis of the students’ online discussion from the collaborative learning

perspective showed that students' main discussion behaviours were directed to generating individual opinions on discussion topics, confirming each other's shared understanding by agreement and sharing practice-based information and social exchanges. However, critical comment was rarely found. These discussion patterns are in agreement with other studies which find that student interaction in asynchronous online discussion are 'information and experience exchange and social networking' (Kanuka and Anderson, 1998; Sing and Khine, 2006) or 'articulating individual perspectives and social presence' (Murphy, 2004).

When students gave comment on a peer's opinion, positive comment (agreement or praise) was much more common than critical comment. The lack of critical comment can be caused by diverse factors: the influence of the discussion topic, South Korea's learning culture and students' knowledge level are all conceivable. First, some discussion topics could not elicit critical comment. To be sure of critical comment, the topic should be approachable from different perspectives. Jeong (2003) finds that debating topics entailing conflicting viewpoints encourage discussion and critical thinking. For example, the week 4 discussion topic encouraged social exchanges (sharing personal stories), where critical comment on a peer's opinion would have been out of place. Guldberg and Pilkington (2006) find that the discussion topics which gave students the chance to share personal experiences often created longer monologue type discussion.

Second, lack of knowledge about the discussion topic can hinder critical comment. In order to make critical comment, the commentator should have wider background knowledge in order to see the topic from holistic and multiple perspectives and evaluate the validity of opinions (Ennis, 1996; Paul, 1982). While the week 6 discussion topic could elicit diversity in perspectives, students' deficient knowledge seemed to limit the critical comment that

they could give. In contrast, there were a few different opinions in the week 9 discussion. This was owing to the fact that students had practical experiences which could supply criteria to evaluate the validity or weakness of peers' opinions.

Third, the general culture and learning culture of South Korea seemed to have an influence. Traditionally, South Korean people tend to be more concerned with the harmony of a larger group, and to avoid open criticism or disagreement which could risk group harmony. South Korean students are accustomed to accepting the teacher's instruction as truth without doubt. Therefore, students are not familiar with critical discourse in which evaluating and questioning other people's ideas are encouraged. Yildiz and Bichelmeyer (2003) found similar response patterns: the students from East Asian countries preferred to agree with others and avoided questioning and challenging. The authors interpreted this interaction pattern as deriving from cultural influence. However, in a learning community in which continuous group interaction is required for learning, expressing critical comment or disagreement may be difficult in any culture. Although participants' national and cultural background was not considered in the analysis, Jeong (2003) found that graduate students expressed agreement ten times more than disagreement in debating task discussions.

The South Korean students were at an early stage of building a learning community as MA course students. The course takes a minimum of two years to complete and this module was their first mandatory one. Therefore, the students may have been reluctant to express different opinions in case it damaged the growth of friendship. There are more possibilities of misunderstanding due to lack of social context cues in online text-based media than face-to-face; hence, students would tend to be more careful when making critical comments. Moreover, the students in this case expressed concern about the quality of their

posted messages because written messages revealed their intelligence or knowledge level (this may also have been influenced by their occupation as experienced school teachers) and in distance learning the messages are the main way of forming their self-image in the eyes of peers. In this situation, receiving critical comment can be felt more strongly as losing face in front of others.

For the South Korean students who are accustomed to a teacher's lecturing, the asynchronous online discussion provided an additional active and novel learning opportunity. The qualitative data from the online focus groups and the qualitative data from the questionnaire converged on the following diverse learning benefits. The most frequently mentioned merit was the diverse perspectives obtained from reading peers' messages. Although online discussions did not take the form of highly interactive discussion, students learnt from reading their peers' diverse opinions and experiences. Other merits stated were an improvement in higher order thinking skills, communication skills (writing skills), ICT skills, social community building, self-directed learning skills and time-management skills. Therefore, the integration of asynchronous online discussion was highly appreciated by the online distance learners.

However, there was inconsistency between the content analysis results and the students' perceptions of learning. According to the content analysis result, evidence of critical discourse and the synthesis of ideas were rare. However, students' perception indicated that they were able to develop 'critical thinking or comprehensive thinking'. This may imply that individual students implemented diverse cognitive processes which were not posted in the shared discussion space, and thus hidden from the transcript content analysis. Or, individual student's cognitive activity may only recognize the diversity of ideas and may

not go on to compare and synthesize these diverse ideas because this is cognitively demanding. In any case, the inconsistency indicates that the content analysis of online discussion transcripts cannot completely reveal students' cognitive processes. As Kanuka and Anderson (1998) contend, online discussion transcripts may reveal part of the cognitive processes involved. Other researchers contend that there is a high degree of vicarious learning or lurking (reading other people's messages without posting) in asynchronous online discussion (Sutton, 2001; Fung, 2004). Therefore, students' perceptions should be asked and supplemented for a holistic understanding of learning in CSCL.

Another limitation may have been caused by the content analysis coding scheme used here. The critical thinking process can involve either the critical thinking required for writing one's own messages (a reasoning process in constructing personal opinions), or the critical thinking required for commenting on peers' opinions. The content analysis coding scheme coded only the evidence of critical thinking as applied to peers' opinions in idea-linking and did not code the other kind of critical thinking.

Students perceived ambivalent feelings toward asynchronous online discussion with regard to being comfortable to participate. A number of students commented that the asynchronous online discussion provided a comfortable participation opportunity for introvert students or students who were inarticulate in speaking, as other researchers contend (Berge, 1997; Bullen, 1998; Harasim, 1990). However, online discussion seemed to have an uncomfortable aspect of a different kind of. Students apprehended the quality of messages as in part due to the archived nature of the discussion. This feature can make students try harder to write high quality messages in order not to lose face. However, if a

student felt ignorant about a subject it would not have seemed comfortable to reveal their knowledge level in so enduring form (at least until the end of the module). Since the most of the enrolled students were quite mature and worked as school teachers, they seemed to feel it would be particularly shameful to lose face due to lack of knowledge.

Contextual conditions seemed to influence students' participation and collaboration

Course design

Assessment: the weekly asynchronous online discussion was a critical learning activity of this module. Taking part on the weekly online discussion (the quantity of participation) together with listening to weekly online lectures accounted for 20% of the final grade. In addition, the students' posted messages could be used for portfolio assignment (30% of the final grade). If students participate in the asynchronous online discussion regularly, they can distribute the burden of the final assignment. Therefore, students should have sufficient motivation to participate in the online discussion. The discussion deadline influenced the participation pattern. According to the assessment guideline, only the posted messages during the discussion period (from Tuesday until the following Monday) were counted for assessment. This made students manage their time effectively to meet the deadline strictly.

Discussion topic and students' knowledge level: when students had more knowledge or experience on a topic, they started to participate earlier; in this way, peers could encounter other people's ideas and had time to respond; the week 4 discussion is a good example of this more interactive kind of discussion. Here, diverse ideas were expressed and responses were substantial. In contrast, when students lacked knowledge or experience, they could not actively participate, messages lacked personal reflection or unique contributions and

responses were rare or superficial. In general, messages posted early received more responses than did the messages posted late. The students with more knowledge and experience were mostly early participants and they gradually became the active participants.

Students' characteristics: as mature online distance learners, they had to coordinate their study, work and other commitments and most suffered from lack of time. Therefore, student participation was mostly concentrated into weekends and the deadline day (Monday). This made student messages more focused on responding to the discussion topic than to peers' opinions, because students were left with little time to comment on peers' messages. Students had to proceed to the next discussion every Tuesday because each unit lasted a week.

Most of the students were female. Their gender may have influenced the greater tendency of this group to agree or make social statements. Some researchers find gender differences in the pattern of online discussion participation (Herring, 1994; Blum, 1999). According to them, females are more polite, likely to thank, appreciate, express more support of others. In contrast, males are more assertive and express an adversarial orientation towards their interlocutors.

For most students, this online discussion was their first experience. However, the lack of no prior experience did not have a negative influence on their participation, because they had sufficient motivation as students of e-learning, to participate for the sake of first-hand experience of its merits and limitations.

Technology feature: the VLE provided two functions for response; 'Re' and 'short comment'. Students used 'Re' when writing a long response and 'short comment' for responses of 1-3 lines. Students seem to think that a short message is not adequate for the 'Re' message function. The use of 'short comment' made it easier and quicker for the students to respond and this in turn made the discussion more interactive.

Tutor's role: the online tutors posted discussion topics, however, could not participate in the online discussion process due to a system barrier. A peculiar thing to note occurred in the week 4 discussion, when the leading module tutor responded for the first time to student messages in the 'Introduce yourself' bulletin board. Although the tutor participated in the other bulletin board, her participation seemed to influence the students' active and interactive discussion in the week 4 discussion. This implies that the tutor's presence motivates student participation directly. Tagg and Dickinson (1995) report that student participation is enhanced when they feel the continuous presence of the tutor.

In the following section, the comparison of the two case study results as found in the students' collaborative interaction patterns and perceptions of their asynchronous online discussion experiences and the contextual conditions which have been shown to influence successful asynchronous online discussion are presented.

CHAPTER 7

COMPARISON OF THE TWO ASYNCHRONOUS ONLINE DISCUSSIONS

In the following, the commonalities or differences in the two case studies were compared and contrasted with regard to students' participation, collaboration patterns and perceptions of their asynchronous online discussion experiences. This leads to some suggestions for effective asynchronous online discussion.

7.1. Students' participation pattern

In both cases, students' participation patterns showed some similar aspects, despite the different learning contexts. On average, 65% students (9.4 out of 12 enrolled) in the UK case and 75% students (13 out of 20 enrolled) in the South Korean case participated in a given discussion. Individuals in both contexts posted approximately one message per discussion (UK students 1.34; South Korean students 1.2). The most active participant students in both cases posted almost 2 messages per discussion. No small group dominated.

Students in both contexts reported that asynchronous online discussion provided a more comfortable and convenient discussion opportunity than face-to-face discussion where barriers to equitable participation exist.

In the UK case, asynchronous online discussion was helpful to lowering the bar for international students' communicating in English as a second language, because it gave them time to write and edit their messages before posting. In the South Korean case, the asynchronous online discussion was helpful for overcoming the online distance learners'

barriers of time and space. Students' perceptions indicated that asynchronous online discussion was also helpful for lowering participation barriers felt by introvert students because they could participate in a more comfortable environment without the co-presence of others. However, the relation between student personality and their participation level was not directly explored in this research.

Students have been reported in other research to comply only with the minimum participation requirement (Hara et al., 2000; Caspi et al., 2003; Chou, 2002). Although in the UK case, students were asked to post two messages per discussion (one for response to the discussion topic and the other a response to a peers' post), they sometimes did not participate at all or responded selectively to either or both of two. These flexible participation patterns seemed to be influenced by the fact that there was no formal assessment. Students' normal weekly learning activities included participating in face-to-face lectures and workshops as well as in the discussion in case 1 and in listening to the tutor's online lectures and participating in the asynchronous online discussion in case 2. In both cases, students had busy schedules with family and work commitments as well as other modules to complete. Considering their compact schedule as adult online distance learners, it might have been too demanding to ask them to post more than 1 message in a week.

Although students did not always participate as much as the tutors would have liked, the quality of the messages was generally high. In both cases, students seemed to put much thought into writing a message. This raises doubts about the value of requiring a specific number of message postings so as to encourage active and interactive discussion, because students may then post superficial messages merely to meet the requirement (Oliver and

Shaw, 2003).

Although asynchronous online discussion provides an ‘anytime anywhere’ chance to participate, they did not do so evenly across the discussion period but concentrated their postings on certain days around the deadline. This raises issues of time management in asynchronous online discussion and choosing the right time to intervene in order to facilitate student discussion.

7.2. Students’ collaborative interaction patterns

There were differences in discussion patterns between the two cases. First, the students’ discussion in the UK case was more interactive than that in the South Korean case. In the South Korean case, there were more serial monologues without peer responses and students seemed to be more engaged in responding to the tutor’s discussion topics rather than in responding to their peers’ messages, for the length of the messages responding to the discussion topic was much longer than that when responding to their peers. In the UK case, the messages included more substantial comment on peers’ opinions and as a result little difference in the length of message between the two (responding to the topic and responding to peers).

There are many possible causes for this difference. First, the discussion period for each topic was shorter in the South Korean case (one week) than the UK case (2 weeks). In general, the South Korean students posted their messages at the weekend or the deadline day (Monday) and a new discussion started the following day (Tuesday). Therefore, the South Korean students may have rushed their responses and due to lack of time not given thoughtful comment on peers’ ideas because comment is only possible after reading

someone else's message. Similarly, Bullen (1998) finds that students concentrated their participation into the final few days and this deterred deep discussion because there was not enough time for students to respond to each other (early participants would find no one else in the environment to discuss with – low 'footfall').

In the UK case, there was quite a long delay between students' responses, but later participating students did find other messages to respond to and had time to reflect on these and comment on them. Students were also asked to respond to at least one peer message. Moreover, the UK students were provided with detailed guidelines for taking part in discussion ('Netiquette') which described how to write and respond to peers' messages and there was also an online discussion facilitator. In addition, the UK students could meet peer students and participated in other group tasks in the classroom session; they could more easily build friendly relationships than the South Korean students, who had limited face-to-face contact. In general, students could be hesitant to respond to someone's message when they did not know them well. It was frequently found that students in the same task groups responded to each other's messages or students with the same nationality responded more to each other in the UK case. In the South Korean case, student discussion became more interactive as they became more familiar with each other. This is related to the need for community building in effective collaborative learning.

Second, there was more frequent critical comment on peers' opinion in the UK case than in the South Korean case. The South Korean students' comments on peers' opinion was predominantly in agreement. This may reflect their different culture. The culture of the West is often said to place more emphasis on the individual and ties to others may be looser. Some educational approaches may prioritize autonomous independent thinkers. In this

culture, questioning and evaluating other people's ideas (a kind of critical thinking) are more valued than in Asian-Confucian cultures in which people, in contrast, may prioritize group cohesion, and hence be less likely to express open criticism which risks group harmony (Tucker, 2003; Tweed and Lehman, 2002). The majority of South Korean students (14 students, 78%) revealed a hesitant attitude to giving critical comment. However, only a minority of students in the UK case showed a hesitant attitude on this point, 3 of them being UK students and 1 Taiwanese. This was not consistent with a stereotypical difference in learning culture (although the sample size is too small to generalize). Yet each cultural group, while having certain features in common, would certainly have had some atypical and individual features contributed by each of its members. One possible explanation may be that the UK students might think that they were host-students with an English advantage, and that it would be discourteous to pass critical comment on international students' opinions. One notable thing was that the UK students' critical comment was directed to the pre-reading article rather than to the opinions of their peers. However, the UK students' perceptions were in agreement with the finding in Hudson, Hudson and Steel (2006), who compared the communication style between British and Dutch students in an international online learning community. They note that the Dutch students showed a more direct style than did the British students who took a more polite and reserved approach.

Reinig and Mejias (2004) have examined the influence of national culture (the USA and Hong Kong) on the number of critical comments in computer mediated discussions and find that students from an individualistic culture (the USA) expressed more critical comment than students from a more collectivistic culture. However, in the UK case, critical comment on peers' opinions was provided by students not only from Western

students but also those from Asian cultures (UK, Cyprus/South Korea, and Indonesia). The latter group may have felt freed from their home culture because they were studying in a Western culture, or even obliged to adapt to the expected learning culture (that of the West). However, this case study is limited in looking for trends because the number of critical comments was small and the backgrounds of the students very diverse.

Third, students' discussions were generally polite and mutually supportive in both cases. Critical comments in the UK case were expressed in an indirect and euphemistic way in order not to give the impression of confrontation. Therefore, the negative aspect of online discussion, flaming (personal attacks such as insults, profanity), was not found in either case. In both cases, students participated in the discussion under their real names; they were mature students and members of a learning community which would be together until they completed the module (in the UK) or the graduate course (in South Korea). These situations may impose certain group norms between students in online discussion. In addition, the 'Netiquette' in the UK case explicitly prohibited flaming. Anonymous participation can make participants more unaware of social norms, which may lead them to engage in uninhibited communication such as flaming (Sproull and Kiesler, 1986). Reinig and Mejias (2004) report that anonymous participants contributed more critical comments than did identified participants.

Fourth, the process of negotiating social meaning was weak in both cases. Critical comment was given one-way and did not elicit counter-argument or on-going discussion because the students who participated tended to participate only once in a thread. Therefore, it was difficult to identify whether any shared understanding was built between the participants. In general, shared understanding or agreement was identified by overlap or

commonality in the personal ideas expressed, not by identifying a process of negotiation. In some cases, an individual student summarized the discussion, but it was difficult to interpret an individual summary as evidence of group convergence because there was no feedback on the summary message and there was a lack of social context cues to help in interpreting the consensual mood. Moreover, the threaded discussion was attended by a small number of students (2-5 students per thread), not by the whole group. So the summary may not represent the convergence of the whole group. Large group asynchronous online discussion seems to have intrinsic limitations for the construction of shared understanding. Stahl (2006, p. 16) mentions the importance of small groups in the shared construction of understanding and Johnson and Johnson (1996) list 'small group' and 'face-to-face' discussion as components of cooperative learning.

7.3. Students' learning in asynchronous online discussion

Most of the students in both cases were positive about the learning value of asynchronous online discussion; 75% in the UK case and 100% in South Korean case. Therefore, the integration of asynchronous online discussion in the module was welcomed by the students of multi-national background in the UK case (92%) and the online distance learners in the South Korean case (94%).

When comparing the two cases, the students who had limited chances to communicate generally valued asynchronous online discussion more positively. The South Korean distance learners valued it more positively than the campus-based students in the UK case, because the South Korean students had no alternative discussion opportunity. In the UK context, international students valued it more positively than the native UK students because the former students, as non-native speakers of English, possibly had more barriers

to communication than the latter in face-to-face discussion.

This implies that the integration of asynchronous online discussion in traditional campus-based courses requires more careful design for students to perceive the real learning value of online discussion. In a classroom setting, the students' perceptions of the value of an online discussion tool may not be high compared to those on an online distance course because they can still discuss and socialize in face-to-face meetings (Putz and Arnold, 2001; Vrasidas and McIsaac: 1999). For example, in the study of Althaus (1997), students valued online discussion because the large class size limited their opportunities to discuss. However, in the study by Vrasidas and McIsaac (1999), students did not perceive the additional learning benefits because they had the opportunity to discuss in a small classroom group.

Students in both cases perceived diverse learning merits from participating in asynchronous online discussion. Students in the UK case listed an improvement of critical thinking, written communication skills, a sense of community, peer learning opportunities and more comfortable and confident participation. Students in the South Korean case listed the development of comprehensive thinking skills, diverse perspectives, communication skills (writing skills), sense of community, self-directed learning attitude, time-management skills, ICT skills and deeper learning about topics. Therefore, the students' perceptions confirmed that asynchronous online discussion was an effective learning tool for developing the required skills and competencies in the so called 'knowledge society'.

7.4. How asynchronous online discussion supported students' learning

Diverse learning mechanisms seem to influence students' learning in asynchronous online

discussion. First, the asynchronous online discussion provided additional active learning opportunities. As a South Korean student stated, if there was no asynchronous online discussion, students' learning activity might have involved only passively listening to online lectures. Second, the text-based and asynchronous mode online discussion provides opportunities to individually reflect and collectively interact (Garrison, Anderson and Archer, 1999; Warschauer, 1996).

The asynchronous and written mode provides more reflection time and self-directed learning opportunities (Harasim, 1990; Heckman and Annabi, 2003). Students can have time to study related resources to supplement their lack of knowledge, reflect on and consider various aspects when constructing their own response to the discussion topics or peers' opinions, or when checking and refining their reasoning process by reviewing their externalized thinking (drafting messages). In the online discussion, students have a clear audience (peer students and the tutor). Therefore, writing a message is a process of self-explanation. In this process, students can organize their knowledge and make explicit their understanding. Moreover, exposure to diverse perspectives and learning to reason about them are important to developing a critical stance (Thomas, 2002; Heckman and Annabi, 2003). These preparatory and writing processes are different from face-to-face discussion or synchronous online discussion, where a prompt response and quick thinking are required.

Owing to the time available for reflection, written ideas are generally more carefully worded, reflective and analytical than spoken ideas (Heckman and Annabi, 2003; Tiene, 2000). Therefore, archived written messages can be used as valuable learning resources and act as a cognitive aid to supplement the individual's limited cognition (listening,

memory capacity), in this way helping students to keep up with the discussion more easily.

In addition, the asynchronous online discussion provided a chance for collective interaction. However, due to low interaction the students' learning seemed to come from accessing a larger pool of thoughtfully written ideas rather than lively discussion. As both cases showed, the asynchronous online discussion provided wider participation opportunities. When there are more participants, there are more possibilities of encountering alternative opinions and experiences. Adult learners bring diverse backgrounds, life experiences and viewpoints; therefore, all the participants are sources of knowledge for each other, distributing cognition (Hutchins, 2000).

As a lively communication medium, however, asynchronous online discussion has several intrinsic limitations. Compared with face-to-face discussion, asynchronous discussion lacks linear turn-taking characteristics and more one-way, immediate exploration is difficult; there are also more possibilities of misunderstanding due to the lack of social context cues (Heckman, Annabi, 2003; Wang and Woo, 2007; Murphy and Coleman, 2004). However, most of the students in both cases did not think asynchronous online discussion was time-consuming and ineffective. Students seemed to perceive more gain from reflection than loss due to limited interaction. This might be different in a working situation, in which easy and effective communication/ negotiation may be valued more highly. As a whole, students' learning in asynchronous online discussion seemed to relate to individual meaning making rather than social meaning making.

7.5. Conditions for effective asynchronous online discussion

Course design

Relation to assessment

In order to persuade students to take an active part, they should perceive the asynchronous online discussion as a critical learning activity. Using the direct assessment of discussion participation or relating to other assignments which entail assessment (as in the South Korean case) is one way of motivating participation. Several studies suggest that one way of encouraging participation in asynchronous online discussion is to assess it (Oliver and Shaw, 2003; Warren and Rada, 1998). In the South Korean case, online discussion participation could improve a student's grade, whereas in the UK case, participation was not directly related to assessment and this seemed to negatively influence students' participation. After the first formal seminar (online seminar 2), no one volunteered for the role of starter and students' interest in the online discussion sharply decreased. However, it should be noted that meeting the required level of participation does not always mean that students engage fully with the discussion. Oliver and Shaw (2003) warn of using assessment (grading) to encourage student participation because this can cause superficial participation, when students posting low-value messages in order to attain the grade, without being substantially committed to discussion. The students in the UK case evaluated the quality of discussion more highly than its quantity.

This raises doubt about the value of requiring a specific number or specific type of message posting (e.g., one message for responding to topics, another for response to peers). This may have the side-effect of hindering natural and autonomous discussion because

participants have to adjust their opinion expression to the requirement. Instead, online discussion should be designed to allow students to perceive its intrinsic value for their learning. For this, the designing of a good discussion topic is very important (Beaudin, 1999).

Discussion topics

The characteristics of the discussion topic are very important in determining students' participation and the quality of discussion (Meyer, 2004; Hara et al., 2000). As seen in the South Korean case, students put much more effort into responding to the discussion topic than in responding to their peers' opinions. What kind of discussion topic is good for stimulating students to take part and to learn?

Students seemed to be interested in topics which allow them to make unique and valuable contributions by reflecting on or making use of their prior experiences. In both cases, the main source of students' contributions was their reflection on prior teaching and learning experiences. Conversely, when students lacked experiences relevant to the topic, the messages lacked personal reflection or any unique contribution. In particular, students seemed to be interested in sharing work-related experiences or tacit knowledge drawn from practice rather than theoretical knowledge. This reflects the students' background, as they were mostly mature graduate students who had ample experience to share from their diverse backgrounds.

Dennen (2005) finds a similar pattern. When the discussion topics encouraged students to share their own perspectives or relate to unique knowledge or experience, discussion developed much more than it did under topics with a specific right answer. Berge (1995)

suggests that the discussion topics should be fit for students' learning needs and related to their life experiences if they are to attract graduate students.

Students' characteristics

Various characteristics of the students impact on their participation level as individuals. Among them, students' level of knowledge about the discussion topics together with their writing skills (since the discussion is text-based), the available time and personality seemed to distinctly influence participation. In both cases, 40%-50% students agreed that a lack of writing skill was a barrier to their participation. In particular, in the UK case, international students had to participate in the discussion in a language foreign to them (English). Their proficiency in English was, then, a critical determinant of their participation level. When reading the online discussion transcripts, the active participants showed proficient English writing skills, whether they were native speakers or international students.

Students' knowledge level about the discussion topics influenced participation, though differently in the two cases. Three-quarters of the South Korean students but fewer than half the UK students agreed that a lack of knowledge about the discussion topics was a barrier to their participation.

For the online distance learners or part-time adult learners, the lack of time was perceived as the main barrier to participation. The 'anytime, anywhere' merit of online participation can mean 'no participation' or 'last-minute' participation if students do not develop effective time-management skills. However, the actual participation levels seemed to be influenced by the perceived value of online discussion or other conditions. When students

perceive more value from taking part in the discussion than from other activities, they seemed to give this activity their priority, in spite of being short of time. The value of online discussion can be intrinsic or instrumental (that of getting a grade).

As some researchers contend, asynchronous online discussion seems to suit introvert students in particular (Berge, 1995; Bullen, 1998; Harasim, 1990). In both cases, the most active participants described themselves as having an introvert personality. In asynchronous online discussion, they felt more comfortable and safe and they could take as much time as they wanted to compose.

Tutor's role

In the UK case, the module tutor and the online discussion facilitator participated. The module tutor posted 1-2 messages per discussion: posting discussion topics to start with and wrapping discussions at the end. The online discussion facilitator encouraged student participation by sending e-mails and welcomed students' participation with social messages in the course of discussion. Therefore, their messages occupied 27% of the posted messages. The two tutors' participation could give the impression that online discussion was an important learning activity in the module, perhaps to compensate for the negative impact of no assessment. In the South Korean case, the online tutors posted the discussion topics but could not participate in the asynchronous online discussion, due to problems with the VLE system (however, in other discussion boards, the leading tutor encouraged students to participate, by means of social messages).

Most of the students in both cases expected tutors to have a more active role in the online discussion (75% in the UK, 67% in South Korea). The most preferred role for the tutor was

as discussion facilitator in both countries. According to Swan (2001), students' satisfaction and perceived learning is related to their interaction with the instructor.

A number of researchers have suggested diverse roles for tutors in asynchronous online discussion; however, sometimes these suggestions are inconsistent with each other. Some researchers have suggested that tutors should take a leadership role (Berge, 1995; Anderson et al., 2001; Oliver and Shaw, 2003), whereas others have cautioned against too much intervention from the tutor because it can lead to tutor-centred discussion (Dennen, 2005; Mazzolini and Maddison, 2003). The problem is to determine the proper degree of tutor intervention. Berge (1995) advises that a tutor's proper participation rate is between one-quarter to one-half of all contributions.

The degree of intervention would depend on the actual participation and interaction process. When students participate actively and manage their discussion effectively, there is less need of a tutor's intervention. Conversely, when students' participation is not active and they are not certain whether have understood, due to lack of knowledge about the discussion topics, there is greater need of tutor intervention.

Student participation is enhanced when they feel the continuous presence of the tutor (Tagg and Dickinson, 1995). Mandernach et al. (2007) suggest that 15 minutes of active participation per day may establish tutor presence better than one or two hours of login three times a week. However, in general, student participation was not distributed evenly throughout the discussion period in either case. Instead, it was centred on certain days (the weekend or the deadline day for South Korea, the deadline or the classroom session day for the UK); therefore, it would be impractical to intervene on other days without participation from students. Instead, the tutor's overall feedback at the end of discussion (as some South

Korean students suggested), detailed guidelines for like the 'Netiquette' in the UK case, or modelling by posting a message as a standard example may be effective (Pawan et al, 2003; Benfield, 2002; Hara et al., 2000; Beaudin, 1999).

Technology feature

Lack of interaction in asynchronous online discussion has frequently been reported. The written and asynchronous communication tool has its unique characteristics, unlike those of face-to-face discussion (Bordia, 1997; Wang and Woo, 2007; Heckman and Annabi, 2003), therefore, expecting the interaction patterns which occur in face-to-face discussion to be repeated in asynchronous online discussion is impractical.

The VLE in the South Korean case provided two functions for response; the 'Re' message and the 'short comment'. Students could choose between these two. 'Re' messages refer to long and formally written responses and 'short comment' are responses taking 1-3 lines. The use of the 'short comment' function made it easier for students to give a quick response, making the discussion more interactive. In general, students seemed to expect that all messages should be formal. Although short comment responses are more likely to be superficial than the 'Re' messages, they are still better than no feedback. At least, students would know whether or not their posted messages had been read by peers or tutors, and how many students had read them. So, providing an indication of 'read or not' or 'how many hits' their posting had had would be helpful. However, it has the side effect that students who receive fewer hits are likely to be discouraged, so, socio-emotional aspects should be considered when designing CSCL tools.

Group size

The discussion group size was 12 (UK) and 20 (South Korea). Researchers report different interaction patterns according to different group sizes. Hare (1962) contends that the students' interaction pattern in large groups is likely to be a unilateral process of presenting individual ideas to the group rather than the bilateral exploration of topics. In addition, students have more control over interaction due to the many-to-many communication feature. They can choose to whom to respond, therefore, comment and response are likely to be distributed in response to interest. The ongoing in-depth exploration of a few opinions is intrinsically limited in asynchronous online discussion in large groups. However, small group asynchronous online discussion was equally unable to guarantee interactive discussion. In Vrasidas and McIsaac (1999), asynchronous online discussion by a small group (four students) did not generate productive discussion, due to the lack of critical mass (also termed 'footfall'). More research is needed on the optimum number for such groups and this is also likely to relate to the time-span over which discussion takes place and therefore to the setting of deadlines.

This concludes the consideration of case studies one and two and discussion as the central collaborative activity. In the next chapter, students' collaboration in different types of group task, group project, is considered in relation to case study 3 and 4.

CHAPTER 8

TWO GROUP PROJECT TASKS IN THE UK AND SOUTH KOREA

8.1. Introduction

In this chapter, students' collaborative interaction patterns and their perceptions were investigated in two different group project tasks supported by different technologies. The aim here is to see if the key themes emerging from the analysis of the first two case studies are also evident in group project tasks.

In group project tasks, members have to depend on other members' works to complete the task. So, the degree of member interdependence is higher than in asynchronous online discussion group. This implies that the degree or types of interaction in group project tasks will be different from those in asynchronous online discussion.

The two cases are located in different context in students' learning culture (the UK and South Korea), the main mode of course delivery (campus-based course vs. online distance course) and the supporting tools (Wiki vs. synchronous online discussion) and other course design related variables.

In case study 3, students' group task was to design and deliver geography lessons with the support of a Wiki program. The collaboration in the group project described in this case study was carried out mainly in a face-to-face mode but at a distance from the campus during students' placement in schools. Wikis are fully editable websites, allowing multiple authors to edit their own or other people's content, which gradually grows to represent the shared knowledge of the contributors. To access the Wiki site, students had to log on; they

therefore left their individual contributions on the site with their identifiers and the history function of Wiki made it possible to identify who contributed what and to which part of the resource. This case study examines how this particular context influenced student collaboration patterns.

Case study 4 concerns a group research task supported by synchronous online discussion (face-to-face discussion could be used in combination) in a South Korean online distance course. Synchronous online discussion provides a more flexible communication opportunity for the online distance learners who have limited face-to-face meeting opportunities. However, the text-based and real-time characteristics of synchronous online discussion could influence the nature of interaction between collaborative members.

The research questions in both cases were:

- Do the students' interaction patterns contain indicators of collaborative behavior (as defined in the previous studies), that is, active and responsible participation, sharing information/opinions/experiences, negotiating different perspectives and coordinating individual activities toward shared meaning making and co-production of products whilst also socio-affectively supporting each other's efforts?
- In the opinion of the tutor and students, does the group project benefit learning? If so, what are its perceived learning benefits?
- How does the Wiki or synchronous online discussion support or limit collaboration and learning within its own context?
- What contextual conditions affect students' collaboration in the group project?

8.2. EcoWiki project (case study 3)

8.2.1. EcoWiki project and my role

This case study was the second phase of research in the Microsoft EcoWiki (Evaluating Collaborative and Constructive Learning with Wikis) project, in which I participated as a member of the research team. The purpose of the Microsoft project was to evaluate the appropriateness of FlexWiki for supporting collaborative group projects in higher education. Although the research purpose of the Microsoft project and my research purpose overlapped to some extent, my main research focus was on students' collaboration patterns, their perceptions and the conditions for effective computer supported group project work. Of particular interest was the extent to which task and technology differences might affect the conditions for productive collaboration. We collected data in the second phase as a research team; however, I analyzed the data relating specifically to my research as presented here.

8.2.2. The module and participant students

This case study was conducted in 2006 on a year-long programme for the Post-Graduate Certificate in Education (PGCE) at a university in the UK. It was a campus-based pre-service teacher education course for secondary school geography teachers. The module title was 'Does the use of ICT enhance geography teaching?' and was the first compulsory module for the course. The aim of the module was to encourage the students to explore the use of ICT to enhance geography teaching. Students were required to collaborate on a group project; to plan and teach two geography lessons using ICT as a teaching and learning aid. They were assigned to 6 groups of 5 or 6 members based on their placement

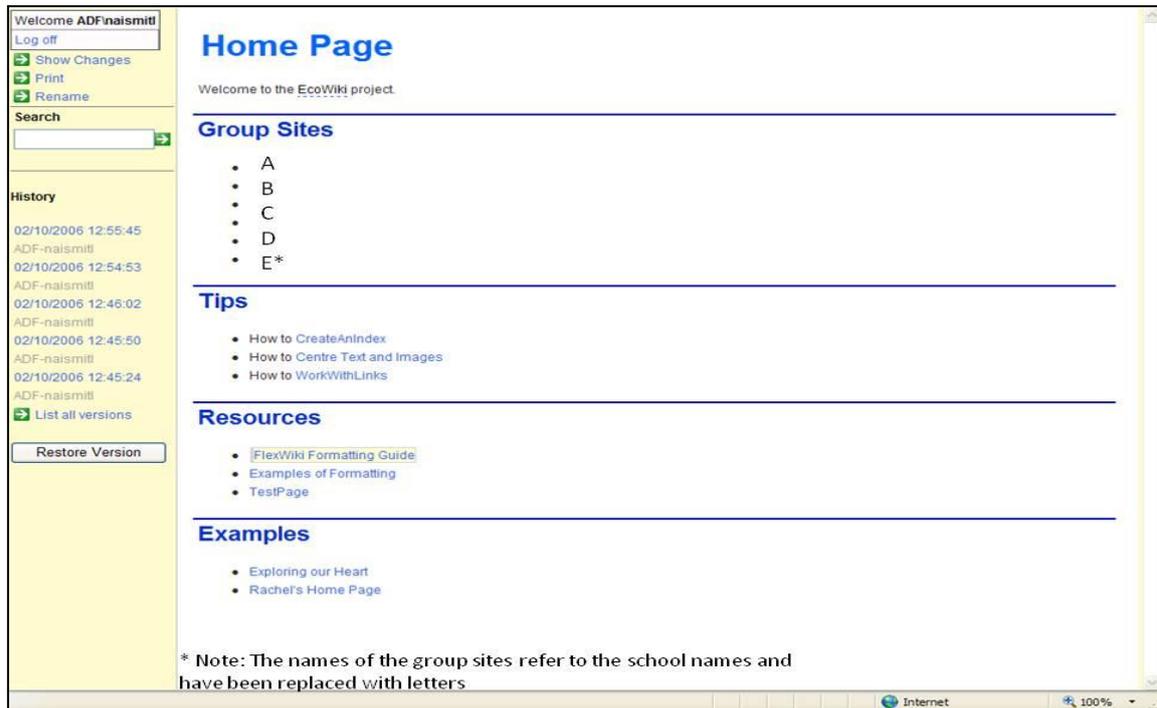
school. A student's placement in a school was determined primarily by the proximity of the school to the student's current residence.

The group project took place over a period of 3 weeks (25th, September to 13th, October, 2006), during which the students spent most of their time on placement in schools but also attended some lectures at the University from the module tutors. The general lesson topic and age-group were determined by the placement school. The placement school mentors supported and guided the students in the processes of the group project. The students were expected to design and deliver their lessons in the placement schools during weeks 2 and 3.

The assessment of the module was based on an individual reflective essay. Therefore, the group project itself was not directly related to this graded assessment. The group project work has been adopted as a teaching and learning method in this module for several years. The only difference between this year and previous year was the provision of a group collaboration tool, FlexWiki.

On the induction day, students were given an hour's instruction on the usage of FlexWiki by the e-learning support staff. During the induction session, each student created a personal profile page which contained formatted text and a link to an uploaded image file. In the working process, technical support could be given by email.

<Figure 1: Home page of Wiki>



Thirty-five students enrolled in this module: 20 female and 15 male. The students belonged to a rather younger age group: 27 students were aged 20-24, 6 students were 25-29, and 2 students were over 30. Most of the students showed familiarity with basic ICT applications such as email, word processing, internet and web search engines, but were unfamiliar with web editing tools of any kind: only 2 students responded that they used a web-editing tool 'regularly' and 20 students responded that they 'rarely' used one. Therefore, the students may have experienced something of a learning curve in learning the Wiki syntax (see Table 8-1).

<Table 8.1> Students' familiarity with ICT according to pre-questionnaires, N=29

	<i>Rarely</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>everyday</i>
<i>e-mail</i>	4	2	7	16
<i>Word processor</i>			21	8
<i>Internet</i>			8	21
<i>Web search engine</i>			9	20
<i>Power point</i>	3	15	11	
<i>Web editing</i>	20	5	2	

Students' pre-trial perceptions indicated that most of them were familiar with collaborative learning and team working, with very positive attitudes to collaborative learning (see Table 8-2).

<Table 8.2> Student's initial perceptions of collaborative work, N=29

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>I am familiar with collaborative team working from my job</i>	6 (21%)	18 (62%)	3 (10%)	2 (7%)
<i>I am familiar with learning collaboratively in groups through my education</i>	8 (28%)	19 (65%)	2 (7%)	

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>I enjoy working collaboratively in groups</i>	6 (21%)	19 (65%)	2 (7%)	

8.2.3. Data collection methods and data analysis

Questionnaire

Two questionnaires (one pre- and one post-) were developed and administered to compare students' perceptions of and attitudes to collaborative group work before and after working on the group project. These two questionnaires contained some closed and some open questions, enabling both quantitative and qualitative data to be collected.

The pre-questionnaire was composed of two sections (see Appendix 4-3). Section 1 asked for students' demographic background information, general level of IT proficiency, previous experience of collaborative work and collaborative learning, and perceptions of some issues of collaborative working (assessment, barriers to group work). Section 2 asked open questions on their initial lesson plan, the roles in the groups and individual expectations about the module.

The post-questionnaire was composed of four sections (see Appendix 4-4): students' perceptions of their collaborative working experience (section 1), assessment (section 2), merits and limitations of Wiki as a collaborative tool (section 3) and their group collaboration process (section 4). Sections 1, 2 and 3 contained closed questions

complemented by a few open questions. Section 4 was composed of open questions only.

The two questionnaires, pre- and post-, had some common questions in order to investigate whether students' perceptions had changed after participating in the group project. The common statements covered attitudes to collaborative learning, perceptions of assessment, and barriers to group project working.

The pre-questionnaire was distributed in the second week class session on campus when students were preparing their first lesson. Twenty-nine students (out of 35) returned the questionnaire, a response rate of 83%. The post-questionnaire was distributed at the plenary session and the response rate to this was 97% (34 out of 35).

(Mini focus) group discussion

The time-scale for this case was very short: after the induction to the Wiki, the main planning phase of the group project lasted only three weeks. Given the large number of students involved and the fact that they were dispersed amongst 6 placement schools, it was difficult to individually interview students or directly observe their collaboration process and subsequent lesson delivery.

Therefore, a short focus group discussion was conducted directly after the post-questionnaire. Each group sat together around a small table in the classroom and was given an A4 sheet of paper which contained five questions on the areas of: roles and responsibilities for effective team working; barriers to team working; assessing team working and project outcomes; and the merits or limitations of the Wiki for the group project. Each group took 10 minutes to discuss the five questions, wrote on their paper a summary of the discussion on each question and returned it to the researcher. All the papers

were marked with a unique identifying number so that the groups and their associated field school could be identified later.

Another 5 minutes were used for a discussion among the whole class on the same topics. Each group made public their points on the five topics and these were recorded on a flip chart where the pros and cons on each point were listed. This two-level discussion provided richer sources of data than at group level or whole-class level.

Observation

Two observation methods were used: participant observation in the classroom session and virtual observation via the FlexWiki site.

Participant observation was conducted four times: the first was at the induction session when students were taught how to use FlexWiki, the second was at the beginning stage when students were preparing their first lesson plan, the third was after the first teaching practice and the last was the presentation session, in which all the groups presented their lesson resources and teaching experiences in front of the whole class. However, the data collection on the student collaboration process was limited. Only from the second observation when students prepared their lesson plan as a group, the collaboration processes were directly observed. In the third and fourth observations, students had already completed some tasks and shared their teaching experiences but they did not plan their work collaboratively.

The Wiki provided the opportunity to track individual students' contributions to their lesson plan. I logged on to the Wiki sites frequently and tracked any changes made. The history function in particular made it easy to identify who contributed to what area of

lesson plan. However, due to access problems from off-site and some students' lack of ICT skills, it was found later that the student who uploaded the data to Wiki site was not always the contributor of the content. In some groups, a computer literate student uploaded all the resources to the Wiki on behalf of the whole group. Therefore, the tracking method had limitations in identifying the real contributors of resources.

Tutor interview

One member of the research team conducted a semi-structured interview with one of the module tutors to explore his views on the purpose of integrating the wiki, success of the project, the merits of FlexWiki, its potential for ongoing use and the need to re-evaluate the assessment model for this course (see Appendix 5-3). The interview transcript was circulated and shared among the research team members.

Data analysis

Quantitative data from the closed questions in questionnaire were coded and entered using Microsoft Excel to enable the aggregate frequencies at whole group and sub-group level to be calculated. Qualitative data from the open questionnaires and focus group discussions were mainly composed of short sentences and phrases. All the responses to a particular question were copied and coded with their identifiers (group name and student identification number). Similar responses were assembled and began to suggest categories. Sometimes qualitative data were transformed to quantitative data by counting the frequency of the types of response which were similar. In some cases, the data between groups were compared and contrasted to find similarities or differences.

8.2.4. Findings

The results are presented in four sections. The first section reports on students' perceptions of their group project experience. The second section describes the students' collaboration patterns: two groups were selected as examples to follow up in richer qualitative detail: one was a more successful group and the other was a less successful group (assessed according to the questionnaire responses). These two groups are compared for differences in their collaborative interaction patterns and possible reasons for such differences, reflected in the focus group and questionnaire response data. The third section reports students' perceptions of FlexWiki as a collaborative learning support tool. The final section reports students' perception of learning from the group project and the enablers and barriers to group project working.

8.2.4.1. Students' evaluation of the collaborative group project

Students' perception indicated that their collaborative group project was very successful and a highly enjoyable experience.

Almost all the students agreed or strongly agreed on the following four statements: 'I enjoyed working collaboratively' (34 students, 100%), 'I feel our collaborative project was successful' (33 students, 97%), 'I was happy with the way our team worked together' (32 students, 94%) and 'I was happy with my group's end product' (33 students, 97%).

However, 41% students (14 students) recognized the overhead time and effort in negotiation and establishing compromises between members' different ideas. Some students' comments in answering the open question also confirmed this limitation;

“...group work takes a lot longer to do simple task, it’s quicker to do it yourself” (group C, student 2)

“More time consuming accommodating 6 persons ideas and splitting work up evenly” (group D, student 1)

“Conflicting ideas of who is right” (group E)

<Table 8.3> Students’ evaluation of collaborative group project in the post-questionnaires; N=34

<i>Statements</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>I enjoyed working collaboratively</i>	5 (15%)	29 (85%)		
<i>I feel our collaborative project was successful</i>	13 (38%)	20 (50%)		
<i>I was happy with the way our team worked together</i>	7 (21%)	25 (74%)		
<i>I was happy with my group’s end product</i>	11 (32%)	22 (65%)		
<i>I think collaborative projects are time consuming and ineffective</i>	6 (18%)	8 (23%)	17 (50%)	3 (9%)

8.2.4.2. Student collaborative interaction patterns

Although every group evaluated its group project experience very positively, there were, however, slight differences in the degree of members' positive response in the post-questionnaire. Therefore, two groups were selected as examples of a more successful group and a less successful group to compare the characteristics of their group working processes and to find what traits contributed to the differences between the two groups.

8.2.4.2.1. The more successful group, Group F

Group F was selected as a more successful group because the members' evaluation of their group project experience was highly positive.

All 6 members strongly agreed or agreed on the following statements: 'I enjoyed working collaboratively' (5 strongly agreed, 1 agreed), 'I feel our collaborative project was successful' (5 strongly agreed, 1 agreed), 'I was happy with my group's end product' (4 strongly agreed, 1 agreed, 1 no response) and 'I learned more from collaborative work than on my own' (4 strongly agreed, 1 agreed, 1 disagreed).

In the open response, group F evaluated its group project as follows: "Very well, lesson taught went well" (student 1), "Our aims were successfully achieved" (student 2), "extremely well" (student 3), "We couldn't [have] worked better together" (student 4), "Very successful, worked well together, outcome was success" (student 5), "very successful project" (student 6).

Individual accountability: active participation and fair contribution

Team members showed individual accountability by participating actively and responsibly: ‘Team meetings were well attended’ (4 strongly agreed, 2 agreed), ‘Individual students made a serious effort to fulfill their roles’ (5 strongly agreed, 1 agreed) and ‘Everyone in group took their roles seriously and contributed fairly’ (3 strongly agreed, 3 agreed).

Positive interdependence: constructive discussion, effective negotiation, cooperative attitudes

Group members were positively interdependent when working together. All members ‘showed interest in other group members’ work’ (4 strongly agreed, 2 agreed) and ‘made constructive comments on each other’s work’ (3 strongly agreed, 3 agreed). Students’ comments in the open questions also supported the evidence of individual member’s fair contributions and effective discussion.

“We all discussed and inputted ideas and contributed equally into forming a lesson plan”
(student 3)

Group F seemed to reach consensus on the lesson plan easily. So, group F was able to divide the work between themselves at an early stage (5 strongly agreed, 1 agreed) and most of them did not perceive the overheads of time and effort needed for negotiation; ‘collaborative projects are time consuming and ineffective’ (5 disagreed, 1 agreed).

Group members had a cooperative attitude and open mind, and this approach seemed to contribute to effective negotiation. They were *“good listeners and compromised”* (student 5), therefore, discussion and negotiation was effective: *“Sharing ideas can make the task*

set more manageable” (student 2).

A peculiar characteristic of group F compared to the other 5 groups was the working group size. On the field school mentor’s advice, Group F was divided into 2 sub-groups each with 3 members. They provided lesson design and delivery within the two sub-groups. One sub-group taught in the first week and the other group did in the following week. Group members expressed satisfaction with this way of working because they could discuss effectively and have a greater role in the planning process and teaching practice.

“Group of 3, found it worked better as a group” (student 2, in the pre-questionnaire open answer)

“...we will all get a larger role” (student 23)

“in 2 groups of 3, can each do more teaching and more practice at planning etc. each teach different sections of teaching”(student 28)

Therefore, all members of group F expressed satisfaction with their roles in the working process (5 strongly agreed, 1 agreed) and with their way of working together (5 strongly agreed, 1 agreed).

The group suggested *“listener, responsibility, commitment, be at all meetings, initiator+organizer, constant humorous injection to the group” (in group discussion)* as enablers for effective group working.

8.2.4.2.2. The less successful group, Group D

Group D's self-evaluation of their group project experience was positive from their answers to the closed questions in the post-questionnaires: 'I feel our collaborative project was successful' (5 agreed, 1 no response), 'I was happy with my group's end product' (6 agreed), 'I was happy with the way our team worked together' (6 agreed). However, the strength of agreement was weaker than that of the other groups. And 4 students showed negative perceptions of the learning advantages of group project tasks by disagreeing with the statement 'I learned more from collaborative work than on my own'. Also, 4 students responded negatively on the open question on what they learned from the project: "Nothing, gained nothing I haven't already done in group work" (student 2), "Nothing, as postgrads, this has all been done before at undergrad level" (student 5). "There were problems with it" (student 3), "Very difficult to team teach" (student 4). They seemed to experience some difficulties in their collaboration process.

Individual accountability: somewhat uneven contribution

The students' responses to the closed questions and the open questions were inconsistent. In the closed question, most of the students agreed with the statements 'I made a serious effort to fulfill my team role' (6 students) and 'I believe everyone in my team took their roles seriously and contributed fairly' (5 students). However, the students' open responses were somewhat different. Two students commented negatively, "Good, but some overdid certain tasks" (student 3) and another student suggested, as a way of improvement, "Equal split of work" (student 2). There seemed to be a problem with the fair division of labour.

Students' preferred assessment method seemed to further suggest a somewhat uneven

contribution in the project. Group D agreed more with assessment based on individual contribution (4 agreed, 2 disagreed) than with group-based assessment (5 disagreed, 1 agreed) in the post-questionnaire.

Problems in member interdependence: difficulty in communication and negotiation

Compared to other groups, group D seemed to have problems in communication and attendance at group meetings. Two students disagreed with the statement “Team meetings were well attended” (Group D was the only group which had ‘disagree’ responses) and 4 students disagreed with the statement “I found little difficulty in finding time to meet”.

For group D, negotiating members’ different opinions was difficult and time-consuming. All 6 students commented on this problem.

*“More time consuming accommodating 6 persons’ ideas and splitting work up evenly”
(student 1)*

“I found it difficult and time consuming. Don’t think group presentation of lessons were great” (student 2)

“Difficult to accommodate everyone’s ideas” (student 3)

“Only 2 lessons but 6 students, very difficult for everyone to have an input” (student 4)

“Too many ideas on same areas to decide upon” (student 5)

*“I found lesson planning as a group far more time consuming than doing it on my own”
(student 6).*

Therefore, most of the students agreed that ‘Collaborative projects are time consuming and ineffective’ (4 strongly agreed or agreed).

As regards the barriers to effective group working, group D agreed more on communication issues rather than individual accountability (in the post-questionnaires). All 6 members strongly agreed or agreed with the statement ‘When collaborative projects fail it is because groups don’t meet up or talk enough’, whereas 5 members disagreed with ‘When collaborative projects fail it is because some individuals don’t work as hard as others’. In the group discussion, they listed “*personality clash, lack of patience, time management*”.

The group suggested “*smaller groups*” (student 4), “*Leader is needed*” (student 6) and a cooperative attitude, described as “*patience, heart of steel, passion*” (in group discussion) as enablers for effective group working.

To sum up, the student perceptual data suggests that these two groups experienced different group dynamics. The effectiveness of the group’s collaboration seemed to depend on the way in which they negotiated members’ different ideas. Group F reached consensus easily, whereas group D experienced problems in their negotiation, what Yamane (1996) calls ‘the transaction cost’. This negative experience led to members’ dissatisfaction with their working process and doubts about the learning value of the group project task. Group members’ interpersonal skills (such as cooperative attitudes and effective communication skills) were critical for effective negotiation. Group F displayed more positive interpersonal skills, such as mutual respect, open mindedness and a compromising attitude, whereas group D showed anti-cooperative attitudes such as the urge not to compromise. Group size also influenced the negotiation process. The more successful group was sub-

divided into two groups of 3 members, making substantial discussion and consensus building easier than it was in the 6 member groups. In contrast, in the group of 6 members, information overload made it difficult to reach consensus, and thus caused some failure in time-management.

8.2.4.3. Students' perceived advantages and limitations of Wiki

Students' perception of FlexWiki as a collaboration supporting tool was somewhat mixed. In the post-questionnaire response, more than half the students (19 students, 56%) 'Strongly agreed or agreed' on 'Using FlexWiki helped me to collaborate'. The advantages and limitations of FlexWiki were identified from group discussions.

8.2.4.3.1. Advantages of Wiki

The Wiki was appreciated as a database for individually developed resources between group members and as a showcase to present their products to others.

Shared resource data base

Everything in the same place (group A)/ Resource data base (group C)/ Everything in one place (group E)

As a tool to deposit what had been done and share plans and resources with others it was very useful... (from the plenary discussion)

Reference tool to look at other people's work

Could look at other groups (group B)

Could use it as a record of best work to share with others (from the plenary discussion)

Flexible access to resources

Access offsite (group E)

8.2.4.3.2. Limitations of Wiki

Negative responses were mainly caused by Wiki's technical problems and students' unfamiliarity with the Wiki.

Most of the students experienced technical problems (29 students, 85%) and a sizeable majority of them perceived Wiki syntax as difficult to learn: 'Learning FlexWiki's commands took a long time' (21 students, 62% agreed).

<Table 8.4> Students' perceptions of FlexWiki, N=34

<i>Statement</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>Using FlexWiki helped me to collaborate</i>	5 (15%)	14 (41%)	10 (29%)	5 (15%)
<i>It takes a long time to learn FlexWiki's command</i>	8 (24%)	13 (38%)	12 (35%)	1 (3%)

The technical problems which they met included: 1) failures of system reliability, including access errors from off-campus and system down (25 students); 2) difficulty in commanding Wiki syntax; 3) capacity limitations in uploading large capacity files such as Power Point

and image files (in the open question response); however, these were remedied by the e-learning staff.

Failure of system reliability

“Not being accessible –system down” (group A, student 2, open-question)

“Wouldn’t open off-site, wouldn’t allow for me to edit” (group C, student 3)

“It was down a lot of time when most needed” (group E, 14)

*“Could not access off campus at first, once this was solved, I was unable to edit the site”
(group D, 20)*

Due to the technical problems, FlexWiki was rarely used as a communication tool in their working process. Instead, students used a more reliable and familiar communication tool, such as email, phones and msn. For this reason, the Wiki site was primarily uploaded during the latter part of the three-week trial, as a repository of individually completed resources.

*“We worked collaboratively without the use of FlexWiki, used email, phones, msn”
(Group F, student 3).*

“Used hotmail attachment instead” (group D, student 1)

“Preferred to use e-mail and memory stick” (Group A)

Preferred to use tried-and-tested e-mail whilst working on the project (from the plenary discussion)

Because of these technical problems, one computer literate student uploaded all the resources in a group, instead of the individual students who had created them.

When I tried logging on to FlexWiki, a number occasions, was not working. So, one person in our group put on everybody's work to create a page with link, although all of us contributed equally (group F, student 1)

One student reflected on the value of FlexWiki as follows:

"Potential utility is very high, but would need to be universally used, only works if everyone uses it" (from the plenary discussion)

Difficulty of commanding Wiki syntax

Students' unfamiliarity with the Wiki syntax limited their actual use of it, even when they could access the Wiki site. Some students reported their difficulty in learning and commanding FlexWiki syntax.

"Takes a while to learn how to edit pages" (group D, student 12)

"The "codes" i.e. syntax was a barrier" (at the plenary group discussion)

"To be able to type in the way it's presented, not the confusing Flexwiki language" (group E, student 2)

Therefore, some students asked for more instruction on the use of the Wiki and more user-friendly syntax. In this case, only one-hour of instruction was given and most of the students were not familiar with web-editing skills. Moreover, the syntax of Wiki needed a new learning curve because it was different from the usual web-editing syntax.

Considering the students' ICT skills, this proved insufficient.

“There was a need for a bit more than 1 hour introduction to it” (from plenary discussion)

“Clearer instructions for use” (group A, student 2)

8.2.4.4. Student learning from Wiki supported collaborative group project

Students' learning in Wiki supported group project could include learning about task-subject knowledge, group working skills, and learning about the Wiki program. Students' responses indicated that they learned about team-working skills and task topic related knowledge (how to use ICT to enhance Geography teaching). However, students did not comment on learning about Wiki. The limited instruction on Wiki usage (only one hour) and some students' avoidance of Wiki due to technical problems and unfamiliarity with it seemed to limit their learning.

Teamwork related skills and understanding

Most of the students mentioned the learning of team work related skills and attitudes (14 students). These are some examples of their open question responses in the questionnaires:

“Best ways of efficiently working as a team yet with divided individual tasks” (group D)

“How to work as a team” (group B)

“Good listener, compromise” (group F).

Some students responded that they had gained more understanding about the difficulties of

group working:

“It’s very hard to plan a lesson with people” (group C)

“group working takes longer” (group C)

“unfair to assess” (group A)

“There can be issues on work allocation” (group E).

The quantitative data also confirmed similar responses. Almost all the students agreed that they learned how to work as a team (32 students, 94%).

Learning about the task-subject: diverse perspectives for lesson design

The other learning merit was discovering diverse approaches to using ICT for lesson design through discussion with peers (7 students); for example:

“Different approaches” (student 3 in group D, from open-questionnaire response)

“Able to gain other people’s perspectives”(student 1 in group E, from open-questionnaire response).

To sum up, students’ learning included both teamwork-related skills and task-subject related knowledge, although the first predominated. It may be the case that group members were directed by completing the task effectively in a limited time schedule, thus focusing on completing their own portion of work, deterring them from learning much about those aspects of the project completed by other members. However, in this case, the Wiki supported students’ learning by providing easy access to the other members’ or other

groups' resources and by this means could get more ideas and understanding of ways to use ICT for teaching.

<Table 8.5> Students' perception of learning from the group project: N=34

<i>Statement</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>I learned more from collaborative work than on my own</i>	5 (15%)	20 (59%)	8 (24%)	1 (3%)
<i>I have learned some ways of working collaboratively on this course</i>	8 (24%)	25 (74%)	1 (3%)	

8.2.4.5. Enablers and barriers to effective collaboration

On both the pre- and the post-questionnaires, students perceived the communication problem as more influential than individual accountability in effective group working (see Table 8.6). Students responded similarly before and after the project. When collaborative projects fail, they thought, 'It is because groups don't meet up and talk enough' (76% on the pre- and 74% on the post-questionnaire agreed) and 'It is because some individuals don't work as hard as others' (52% on the pre and 56% on post-questionnaire agreed)

<Table 8.6> Influencing factors of project: pre-and post-questionnaires, N=29(pre), 34(post)

<i>Statement</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>When collaborative projects fail it is because some individuals don't work as hard as others</i>	2 (3)	13 (16)	12 (11)	2 (2)
<i>When collaborative project fails it is because groups don't meet up or talk enough</i>	1 (6)	21 (19)	5 (8)	1 (1)

*(): response in the post-questionnaire

In the group discussion, various issues were raised as enablers for effective team working. There was a difference in response depending on each group's experience. As a whole, groups reported effective communication related issues most frequently, such as open-mindedness, compromise, patience, passion, good listener, open communication. The other enablers were leadership and individual accountability.

The main barrier to effective group projects was communication related problems (such as personality clashes or resolving conflicting ideas, absence from meetings). In particular, large group-size (5-6 members) caused information overload and difficulty in negotiation, thus hindered proper time management. Other issues included failure of ICT, lack of responsibility and lack of shared roles.

<Table 8.7> Enablers of effective group working

	<i>Focus group discussion</i>	<i>Plenary discussion</i>
<i>Interpersonal skills/ effective communication</i>	<p>Open mind (group B)</p> <p>Ability to work together, Compromise (group C)</p> <p>Patience, heart of steel, passion (group D)</p> <p>Listener (group F)</p> <p>Regular meeting, regular communication (group A)</p> <p>Share ideas (group C)</p> <p>Pooling of ideas (group E)</p> <p>Be at all meetings (group F)</p>	<p>Regular meetings</p> <p>Use e-mail in between meetings to share resources</p>
<i>Leadership</i>	<p>Team leader (group B, D)</p> <p>Initiator + organizer (group F)</p>	<p>Need leadership</p>
<i>Individual accountability</i>	<p>Commitment/responsibility (group F)</p>	<p>Need to be committed</p> <p>Need to 'pull own weight' in the group</p>

<Table 8.8> Barriers to group working

	<i>Focus group discussion</i>	<i>Plenary discussion</i>
<i>Large group size – difficulty in compromising and time management</i>	<p>Information overload (group A)</p> <p>Too many ideas (group B)</p> <p>Conflicting ideas of who is right (group E)</p> <p>Time management (group D)</p> <p>Time (group B)</p>	<p>Difficult working in large groups- groups would be better if half the size</p> <p>Difficult to get a consensus amongst six</p> <p>In relation to time management difficult to merge six products into one framework</p> <p>Time management</p>
<i>Lack of cooperative attitudes</i>	<p>Personality clashes (group D)</p> <p>Conflicting personality (group F)</p> <p>Lack of patience (group D)</p> <p>Ego (group C)</p>	<p>Danger of treading on other people’s toes if there is a leader or a more dominant member of the group who wants to do a particular activity.</p>
<i>Communication problem</i>	<p>When people don’t share their ideas (group E)</p> <p>Communication (group C)</p> <p>Not able to meet in a group (group C)</p>	
<i>Others</i>	<p>Failure of ICT (group A)</p> <p>Not pulling their weight, Different skills-one may be missing (group F)</p>	<p>Editing- whose role is it to pull it together?</p>

Student perception of group project assessment

In this case, the group project task was not directly assessed for the final grade, but there was a peer review opportunity at the final session. Students' opinions of group project assessment were explored in both the pre- and post-questionnaires.

In both questionnaires, students expressed great preference for the assessment method which considers various components such as outcome, teamwork, individual contributions (pre: 90%, post: 85%) rather than individual-based assessment (pre: 52%, post: 65%) or group-based assessment (pre: 48%, post: 35%).

<Table 8.9> Students' attitude to assessment, N=29(pre), 34(post)

<i>Statement</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>Collaborative projects should be assessed as a whole</i>	2 (2)	12 (10)	9 (14)	5 (5)
<i>Collaborative projects should be assessed individually</i>	7 (3)	8 (19)	13 (12)	
<i>Collaborative project grades should have different components (outcome, teamwork and individual effort)</i>	11 (6)	15 (23)	3 (5)	

*(): response in the post-questionnaire

Students' responses in the open questionnaire were similar: 8 students (out of 18 responding students) stated that assessment should consider diverse components: an overall

group mark, an individual mark (a small portion) and other components. And a few students suggested peer assessment, self assessment and mentor assessment.

“Small portion on individual to ensure everyone does something but the point of team work is what you produce as a team. Mainly marked as a group” (group D, 18)

“A number of components, group overall but awareness of what each person did too, peer assessment, assessment by those who the outcome of school” (group F, 5)

Some students were opposed to group-based assessment because of the possibility of unfairly reflecting an individual’s contribution.

“Group assessment in my experience is generally very unfair and not a clear reflection of individual effort” (group A, 1)

“There is a lot of work for some but others do very little making it difficult for the rest, but they got the credit too” (group E, 2)

Another student expressed worries about individual assessment because it is difficult to separate the individual’s contribution from the product.

“There is a difficulty in separating out who did what when viewing the product, in this case, one person may do the editing for the group and that role may be relatively invisible” (from the plenary discussion)

The assessment method influences how students participate and collaborate in the group project, so, it should consider the diverse components which contribute to successful project implementation.

8.2.4.6. The module tutor's perspective

The module tutor evaluated the students' group project (the quality of teaching resources and presentation) as very good and believed that the Wiki supported group collaboration successfully. According to him, the aim of the group project was for the students to have opportunities to share experiences. He concluded that his aim was fully met because more students referred to having learned from other students or other groups in their own individual assignments than had done in previous years.

One of his primary motivations for adopting Wiki was to encourage students to use diverse ICT-based tools as teaching aids, as this is what they will be expected to do as teachers. Although the Wiki was adopted as a group collaboration support tool, the tutor did not specify the way it was to be used for this purpose.

He appreciated Wiki both for students and tutors. He thought Wiki's main function was as a resource data base in which students put everything that they had created. Additional merits were that it enhanced group cohesion and motivation to create higher quality resources because members would think that, "*this is going to be our show, people are going to look at it*". Wiki was also useful for the tutor to monitor anyone who is struggling (although he did not intervene in the group management process) and as a demonstration tool for the external regulatory body, OFSTED.

As regards the barriers to using Wiki, he listed the difficult interface as an issue for student users and on-going technical support for tutor-users. He said that implementing the technical support role was very challenging for a tutor who was not confident of ICT use.

Regarding the tutor's role in the collaboration process, the module tutor was "*open-ended as to whether they want to split group further or even work individually*", therefore, he did not intervene in students' collaboration process. Instead, how to manage the group was left to the placement school mentors. Most of the students responded that there was enough guidance from the tutors, school mentors and technical staff (30 students agreed). In general, effective collaborating groups seemed not to need external support. As a student said, "*Didn't need much, worked through ourselves*". However, a group member whose group experienced negotiation problems responded that support was "*lacking*".

8.3. Online group project in South Korea (case study 4)

8.3.1. The module and participants

This case study was conducted on a postgraduate online distance course at a graduate school for teacher education in South Korea in 2007. The module title was ‘Cyber space and adolescence’ and its purpose was to provide teachers and prospective teachers with an understanding of adolescent culture and behaviors in cyber space. The module was delivered via 11 online sessions and 3 off-line sessions. Online sessions were taught by five team-lecturers. The leading tutor adopted a group project assignment for this semester with the purpose of providing first-hand experience of collaborative learning for the pre-service teachers. The group project task was to select a research topic relating to the module contents, research as a group, and present their results in the final classroom session.

The group project task was worth 60% of the final grade: for participation in the online discussion (20%) and the quality of the outcome (40%). For the group project, the online distance students were required to hold at least 3 synchronous online discussions. Students could use any chat programs for the group project, either the synchronous online discussion tool embedded in the university VLE or a commercial ISP’s chat program because the newly adopted university VLE system had some problems of reliability. Students were required to save the synchronous online discussion transcripts and submit them to the tutor. When students met for discussion, they were asked to submit their discussion minutes.

The first session held in a classroom session where the module tutor introduced the module

overview and the group project assignment. An initial face-to-face meeting is helpful for building trust and familiarity among online distance learners. Students were also asked to introduce personal information about themselves on the course website discussion board 'Introduce myself'. The module tutor divided the 8 students into 2 groups of 4. Each group was asked to select a group leader, but the role specifications of group leader were not set.

The eight participant students were all females who were studying various subjects in postgraduate school of Education and the module was elective.

Group A had a more homogeneous background in their study subject and working areas. Of these 4 students, 3 were studying infant education and had worked as pre-school teachers. In addition, two students were acquaintances before they enrolled on the module. The students in group A were also older than those in group B: two students were in the age-range 39-44, another in the age-range 33-38 and one student did not respond. Therefore, all these students had to get used to corporate study and working as adult learners. One student in particular lived far away from the others, so, it was difficult for group A to meet easily face-to-face.

Group B was composed of students with different specialism; therefore, their study subjects were heterogeneous. They were younger than the students in group A (3 students were in the range 27-32 and the fourth in the range 33-38); however, they too had to combine study with work and/or family commitments.

There was no significant difference between the two groups regarding their previous experience and familiarity with collaborative learning. Three students in group A (1 student did not respond) and 4 students in group B mentioned previous experience of group project

or collaborative learning. In both groups, half of the students agreed with the statement ‘I was accustomed to collaborative learning through my previous learning experience’ (2 agreed and 2 disagreed in each). Four students in group A and 3 students in group B had had previous experience of online discussion.

8.3.2. Data collection methods

Synchronous online discussion transcript: to implement the group project the students were required to hold more than 3 synchronous online discussions. Therefore, the online discussion transcripts were the main source of data for the students’ collaboration process. Group A held 4 online discussions and group B held 3 discussions.

Group reflection diary: one of the assignments was writing a group reflective diary about their group project experience. Each group met face-to-face and discussed the following topics suggested by the researcher: 1) the advantages and limitations of a group project; 2) what you learned personally from the group project; 3) the difficulties or barriers with group projects; 4) the most important enablers for successful group projects; 5) the merits and limitations of online discussion and face-to-face discussion for group project; 6) any suggestions for improving group projects in the future

Questionnaires: the post-questionnaire used in case study 3 was adapted to accommodate the different learning context and data collection situation of case study 4. In this case study, synchronous online discussion was used for a collaboration support tool instead of Wiki (as in case 3) and rich data on student collaboration process could be obtained from the online discussion transcripts instead of the open-questions of case 3. The questionnaire was distributed at the final face-to-face session. All 8 students attended and returned their

questionnaires, making the response rate 100%.

Tutor interview: the tutor interview was conducted in her office after the final session. It lasted almost an hour. The interview schedule included: 1) the purpose of adopting a group project; 2) the principle of group composition and its rationale; 3) tutor evaluation of the project outcome; 4) the assessment method of the group project; 5) the tutor's role of supporting the group project (see Appendix 5-4)

Observation: I participated in the final face-to-face session and observed the presentation by two groups' of their group research outcomes. The group presentation took almost an hour. There was a marked difference in presentation style between the two groups. In group A, every student presented her own portion of the work, with all four students participating, whereas in group B, one student speaking for them all presented the whole research outcome.

8.3.3. Findings

In the rest of this chapter, first, the two groups' perceptions of their collaborative group project experience are presented. Second, the two groups' collaborative interaction patterns are described, mainly by using online discussion transcripts and supplemented by their perceptual data based on a quantitative analysis of the closed question responses in the questionnaires. The two groups' collaborative interaction patterns are described under the heading of critical components of collaboration: the negotiating process, coordination of activities, social community building and individual accountability. Last, two group students' perceptions of learning from the group project, merits and limitations of synchronous online discussion for supporting group project, barriers to group project

working were reported.

8.3.3.1. Two groups' different evaluation of their group project experience

The two groups' evaluation of their group project experience was quite different. Group B evaluated their experience more positively than group A with regard to enjoyment, successful implementation and satisfaction with their group working process and end product (see Appendix 7: statements 1- 4).

Regarding the statement 'I enjoyed working collaboratively', in group A, only 1 student agreed while 3 students disagreed (2 disagreed, 1 strongly disagreed), but all the students in group B agreed (1 strongly agreed, 3 agreed).

The two groups perceived the success of their group project differently. On the statement 'I feel our group project was successful', group A split evenly (2 agreed, 2 disagreed), but all 4 students in group B agreed (1 strongly agreed and 3 agreed).

Group members' satisfaction with the end product and way of working was also different. On the statement 'I was happy with my group's end product', 3 students in group A disagreed, but all 4 students agreed in group B (2 strongly agreed and 2 agreed). Regarding the statement 'I was happy with the way our team worked together', only 1 student in group A agreed, whereas all the students in group B agreed (1 strongly agreed and 3 agreed).

The two group's different perceptions of the group project experience implied different group working dynamics. In the following, the two groups' collaboration processes are described.

8.3.3.2. Two groups' collaborative interaction patterns

8.3.3.2.1. Negotiating process to reach consensus on the research plan

The group task was to choose a topic relating to the module contents, research as a group and to present the product at the final face-to-face session. It was a completely open-ended task. Overall, group A went through divergence, conflict and confusion in deciding the project topic and defining the task. However, group B reached consensus on the above aspects harmoniously and effectively.

Group A

Divergence in opinions

At the first online discussion, a student suggested a topic relating to computer use by infants. This seemed natural, considering their study area and occupation (infant education). They shared ideas on the current state of this subject and internet addiction, how to instruct infants in the correct use of the computer and the need for interconnected efforts between parents and infant educational institutions to protect infants from computer addiction. There was some debate concerning the focus of the topic as to whether it was "Instruction of infants in the correct use of computers" or "Protection of infants from computer addiction"; however, they seemed to converge on one topic area: infants' use of computers. However, one student (J) suddenly raised an objection, as follows:

"Although I am a headteacher for preschool children, why should the topic be infants?"

She (J) suggested an alternative topic area: adolescents' use of the Internet. She advocated the view that a topic relating to adolescents' internet use would be easier to complete

because there are much more resources than in the area of infants' computer use.

“If we select adolescents as subjects, there would be more resources because adolescents use computers most frequently...”

She would not compromise in subsequent group discussions. After she had finished, another student (M) agreed with her proposal. So, group A divided into 2 sub-groups supporting two related but different topics. The two students who were already acquaintances wanted to research on infant's computer use and the other two students (J and M) wanted to research adolescents' internet use.

Choosing a topic requires the consensus of group members on a preferred option. Here, this was a problem because there was not one objective correct answer. The choice can be justified according to different values. The two sub-groups of students seemed to have different underlying goals in relation to the group project, which hindered consensus building. The two students who wanted to research infants were motivated by the intrinsic learning value (relevance of their study areas and occupations), whereas the other two students wanted to research adolescence and were driven (extrinsically or strategically) by their perception of what would be most likely to lead to the successful completion of the project, considering the limitations of time and access to resources as adult online distance learners.

In collaborative group work, negotiating different ideas is a major challenge. If constructively resolved, the group can progress to the next stage smoothly and more learning can be acquired during the negotiation process. The negotiation requires high-level interpersonal skills because decision-making should not hurt the feelings of members

whose ideas are not accepted. If some members feel that their opinions are not respected, their ownership of the task will be weakened and their motivation to participate will in turn be influenced negatively.

Postponing decision-making

Group A's strategy was to postpone the decision until the next face-to-face meeting. They agreed to search for more resources regarding the two areas and decide the topic at the next face-to-face meeting.

Compromise: accommodating the two sides' opinions equally

When they met in the face-to-face meeting in April, they decided the provisional topic: 'The influence of instruction for infants using computers on adolescents' computer use' and divided the work roughly according to their preferences: two students researched the infant area and the other two students researched the adolescent area and they agreed they would integrate the two areas later. I could not discover how their face-to-face meeting went, but was limited to the result from the group A's meeting minutes. It seemed that their initial different positions had not changed. Therefore, the topic was a rather wide-ranging topic because it sought to bridge the suggested topics from the two sides'. It caused difficulty in bringing the two different sub-topic areas together to form a coherent product: this was to prove the hardest challenge for group A.

Confusion, conflict, frustration and repetition

At the second online discussion, they discussed the overall framework of the research plan (research purpose, method and sub-contents), decided the issues on the 5 sub-content areas

to be included in the research and assigned them to the 4 members. Although they agreed on the topic at the previous face-to-face meeting, they seemed to lack a clear idea of what they should do. Students expressed individual opinions sporadically, but their discussion jumped from one topic to another, making the on-going exploration of specific issues and in-depth discussion difficult. For example, in regard to the research method, one student suggested a case study method, another student insisted on conducting a questionnaire and a third suggested a literature search. However, from the online discussion transcript it was difficult to identify what was agreed on as a research method or whether the students built up a shared understanding about the issues they discussed. The style of collaboration was mixed, some students demonstrating dominance and others passivity. When a student insisted strongly on an idea, other students responded passively by simply accepting her opinion, although they seemed not to understand what each others' meaning was or what exactly they had agreed on. Overall impressions were that group A had only a vague understanding of the whole picture of the project (although they seemed to agree on a research framework by deciding on the 5 sub-content issues), and so, they lacked a clear idea of what to do and how to proceed.

At the third online discussion, they repeated the discussion on the research plan: titles for the sub-content topics, how to arrange the sub-content coherently, whether the sub-content was suitable to address the topic, how to collect data. At the beginning of the discussion, two students disagreed over the procedure: one student who acted as the discussion leader wanted to share individually prepared resources and check whether there was any deficiency or overlap in the individually prepared resources, whereas another student was strongly opposed to the discussion leader's opinion and insisted on discussing the framework further. This implied that group A failed to share understanding of what had

been agreed in the previous discussion. The discussion leader thought that the overall framework had been decided in the previous discussion, whereas the other student thought that the framework was not complete and wanted to give it more discussion and refinement. The two students' different opinions on the procedure led to an uncomfortable atmosphere.

Group A discussed the framework again for a long time, but could not decide on a satisfactory research framework in which the sub-contents were coherently connected. They realized that the connection between the topic and sub-content topics (which had been decided in the previous online discussion) was weak. So, the discussion moderator in frustration concluded that "At the moment, the topic is not clear...". Group A seemed to go back to the starting point again after a long discussion. They decided to hold another online meeting.

Reaching consensus on the research plan at the last stage

At the last (4th) online discussion, they changed the project topic from 'The influence of instruction for infants using computers on adolescent's computer use' to 'How to help adolescents in the correct use of computers'. This seems to imply that one member of the group had gradually weakened the resistance of the other members over the three meetings. With time running out, they needed to agree to something which would give coherence to the project. Group A thought this topic offered a logical way to integrate each member's prepared resources. Therefore, the focus of the project changed from infants' to adolescents' use of computers at this last stage. They fixed sub-content issues, distributed them for individual working and agreed to share them before the next face-to-face presentation session. However, it was not identified whether group A had time to share and coordinate each individual's work before the presentation.

Group B

Mutual respect, harmony, reaching consensus on topic without negotiation

Group B reached consensus on the project topic early and easily. At first, three topics were suggested by three students: 'E-learning websites for primary students', 'UCC (User Created Contents) as a form of self-expression', and 'Students' behavior on e-learning sites'. But students agreed on the 'UCC' topic almost too easily, eliminating any need for negotiation. Every member seemed to be interested in and satisfied with this topic. They showed mutual respect about each other's opinions and no one appeared to dominate the discussion. Therefore, they could successfully progress to the later stages without any explicit conflict among members. Harmonious relationship, focused activity and shared roles seemed to contribute to effective collaboration. They autonomously divided the roles according to the functions in the working process: main knowledge provider, coordinator, organizer of the presentation resources and presenter. A student who responded to the researcher's follow-up email interview described their group working process like this:

...first of all, all members could participate actively because they had interest in the project topic...Our group was good at teamworking. Individual member's personality fitted well with each other. We agreed on the project topic, so, the project progressed very smoothly. Selecting the parts which individual members took was also decided smoothly Division of the work was also progressed without conflict. In addition, one member had affluent knowledge on the topic, therefore, she took the leading role in this core area. Also, another student volunteered the role of coordinator, contacting and checking for the meeting and task progress..."(student E)

Therefore, the two groups contrasted in the following respects: the specificity (clear focus) of topics, the harmony amongst members and the shared division of roles. First, group B found a common interesting topic, so, shared a group goal and had a clear focus by which to integrate the sub-contents. However, group A's topic was broad, so, lacked a clear focus to integrate two different areas into a unified output (infant area and adolescent area), so they experienced difficulty at the planning stage. Second, the members in group B had cooperative, mutually respectful and compromising attitude, and so, built a comfortable and friendly atmosphere easily. However, in group A, one member revealed a strong personality in the working process. Third, group B developed functional role division autonomously and harmoniously, but group A seemed to be in confusion and there was an implicit struggle for the leader's role. The group had chosen a leader (student M, this was done by the asking of the module tutor at the first face-to-face session), but she did not act as a discussion leader (according to her, she was chosen as a leader because she was the youngest in the group). Instead, another student moderated the online discussion from the first. Moreover, one student (student J) expressed hostility toward the discussion leader. The selected formal leader (M) and this student (J) took sides when deciding the topic. My impression was that the disagreement over the role of leader seemed to cause a status struggle.

In the questionnaire (see Appendix7: statements 5 and 6), group A evaluated their working process negatively, but group B evaluated it positively. Regarding the statement, 'Our group collaborated well in the group working process', 3 students in group A disagreed (2 disagree, 1 strongly disagree), but all 4 students in group B agreed (1 student strongly agreed and 3 students agreed). The two groups also evaluated their negotiation process differently. On the statement 'Issues were not resolved easily and we had difficulty in

negotiating opinions', 3 students in group A agreed (including 1 strongly agree), however, all 4 students in group B disagreed.

8.3.3.2.2. Coordination of individual work and joint work

There needs to be a balance between individual working and joint working for successful completion of group tasks (Rummel et al., 2002). After deciding on the topic and research plan, the whole task is sub-divided and distributed for individual working. After the individual working phase, the individually prepared sub-tasks have to be brought back to group discussion for coordination and revision (if necessary) to produce a unified product. The two groups differed in the degree of coordination.

Group B: Timely progress and balance in individual work and joint work

Group B agreed on the research topic easily and could proceed to the next stage in a timely manner. At the first online discussion, they shared some initial ideas about the research topic, but postponed the decision because one member did not participate. At the second online discussion in March, they decided on the research topic. They selected 'UCC as a medium of adolescents' self expression' and agreed to search for resources and bring them to the next face-to-face meeting in April. At the first face-to-face meeting, they shared individually prepared resources, decided the 5 sub-content topics to be included in the project and distributed the sub-content topics to individual students. At the third online meeting, they checked progress and set the provisional deadline and procedure to prepare the presentation of the resource. At the last face-to-face meeting, they shared ideas on the individually prepared resources again, revised and fixed the final sub-contents of the group work, and selected the presenter for the final face-to-face session.

Timely progress allowed them to coordinate the individual parts for an organized whole. They were able to balance individual working and joint working, the division of work and the synthesis of individual contributions.

<Table 8.10> Group B's progress in each discussion

<i>Month</i>	<i>Discussion</i>	<i>Progress</i>
<i>March</i>	2 online discussions	Agreement on topic
<i>April</i>	1 face-to-face discussion	Sharing resources, setting title and sub-contents, dividing the work, setting ground rules of working
	1 online discussion	Checking individual's work and progress
<i>May</i>	1 face-to-face meeting	Sharing resources and ideas, setting the final sub-contents, selecting presenter

Group A: Failure in timely progress and lack of time for final coordination

Group A's progress was delayed. Group A decided the topic at the face-to-face meeting in April (whereas group B had decided the topic in March). After deciding the topic, they could not progress to the next stage effectively, due to the breadth of the topic, which included two sub-topic areas. In the subsequent discussions, they tried to coordinate two sub-areas to make a coherently interconnected product. However, there was a lack of clear focus when it came to integrating the two areas into a unified product. They repeated their discussions about the research plan until the last online discussion in May. Accordingly, group A had too little time to coordinate individually prepared sub-tasks for final

presentation as the group's product.

<Table 8.11> Group A's progress in each discussion

<i>Month</i>	<i>Discussion</i>	<i>Progress</i>
<i>March</i>	1 online discussion	No agreement on topic
<i>April</i>	1 face to face meeting	Deciding topic, roughly dividing up the work, setting time for next online meeting
	1 online discussion	Sharing ideas, setting sub-contents, division of work
<i>May</i>	1st online discussion	Conflict on procedure: checking the progress of individuals' work vs. more discussion on the picture of the project as a whole Confusion once more over the project topic and sub-contents
	2 nd online discussion	Confusion and conflict on the topic and framework (how to organize sub-contents); at last, fixed the topic and sub-contents and re-divided the work

Students' responses in the questionnaires confirmed group B's early division of work and joint working. All 4 students in group B agreed both on 'Our group divided the work among members from an early stage' and 'Our group mostly worked on all parts of project together by discussion'. However in group A, 2 students agreed on the first statement 'early division of work' and 2 students agreed on the second statement (see Appendix7: statements 7 and 8).

8.3.3.2.3. Social community building

For successful collaboration, group members need to build trust, group cohesion and a sense of community (Royal and Rossi, 1996; Bruffee, 1999; Dede, 1996). When members lack a sense of community and trust, they are likely to be anxious, defensive and unwilling to collaborate (Wegerif, 1998). Here, the two groups contrasted in the content of their conversation in synchronous online discussions.

Group A: task-focused formal discussion and lack of social community building

Group A used the synchronous online discussion tool as the main communication medium for task completion, which allowed them to focus on task-related formal discussion. Group A's first online discussion started in a somewhat tense and uncomfortable mood. They seemed to experience technical problems in meeting together online. So, they talked about technical problems: for example, how to invite other members to the chatting space. I could not therefore find that they greeted each other at the beginning of discussion. In the subsequent online discussions, they rarely exchanged personal conversation except for greetings at the beginning, saying good-bye at the end, and informing each other of their private schedules when setting up the next meeting time. Group A also rarely used emoticons to support their communication. This is perhaps because three members, as rather mature students, may not have been familiar with using emoticons, or it may reflect the more formal and task-related nature of their discussions. However, the atmosphere of group A's online discussion felt less friendly, even aggressive at times.

Group B: balance in task-related discussion and community building conversation

Group B's online discussion was mixed with task-related discussion and social conversation. The first synchronous online discussion started in a friendly mood. They greeted each other and shared personal conversation before discussing the task. At the second online discussion in March, they decided on the project topic. After this, they exchanged private conversations. One student asked the others to show understanding of her busy schedule when setting meeting times because she had to attend to field practice in her secondary school as a requirement of the pre-service teacher education program. This prompted quite a long private conversation within the group. Another student shared her prior bad experiences in her field practice placement school and was frank about revealing her unpleasant feelings. The other students would have to attend field school practice in the following year, so all of them were interested in this topic. They also talked about other personal matters, such as their concern over writing a thesis for graduation and the psychological pressure this created. At the third online discussion in April, similar types of conversation were included. After the task-related discussion, they discussed having dinner together at the next face-to-face meeting.

Moreover, group B used more emoticons to support their conversation, such as ^^, ⇨, ☺☺☺ (smile), --;;;, !!!!. They seemed to be familiar with using emoticons in their conversation, which made it look very unforced. Therefore, the atmosphere of group B's online discussion was felt to be warm, comfortable, relaxed and friendly.

To sum up, the content and the atmosphere of online discussion in the two groups were quite different. From the first, the students in group B seemed to enjoy more personal

harmony than group B. The initial comfortable feeling in group B promoted personal conversation. The exchange of social conversation and the use of emoticons reduced the social distance between members and seemed to contribute to building trust and friendly relationship, which are crucial for successful collaboration.

In contrast, the initial feelings of discomfort seemed to compel group A to focus on formal discussion. When students cannot feel comfortable with each other, the choice is usually to concentrate on the given task. The uncomfortable atmosphere seemed to influence the collaboration process negatively. In addition, the problems experienced in the negotiating process seemed to aggravate the flaws in their relationship.

8.3.3.2.4. Individual accountability

The accountability of group members seemed to be higher in group A than group B. This was evidenced by the participation rate in the synchronous online discussions and the students' response in the questionnaires.

<Table 8.12> Group A's online discussion participation: the number of lines

	<i>1st</i>	<i>2nd</i>	<i>3rd</i>	<i>4th</i>	<i>Total</i>
<i>Student 1</i>	117	96	144	117	474
<i>Student 2</i>	72	51	50	65	238
<i>Student 3</i>	37	56	115	71	279
<i>Student 4</i>	100	56	121	112	389

<i>Total</i>	326	259	430	365	1380
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<Table 8.13> Group B's online discussion participation

	<i>1st</i>	<i>2nd</i>	<i>3rd</i>	<i>Total</i>
<i>Student 5</i>	54	10 (late participation)	41	105
<i>Student 6</i>	58	72	63	193
<i>Student 7</i>	No participation	107	50	157
<i>Student 8</i>	67	99	49	215
<i>Total</i>	179	288	203	670

All the students in group A participated in every discussion. However in group B, 2 students were late or absent from their online discussion. In the open questionnaire, also, two students in group B pointed out 'the occurrence of free-riders' as a drawback in a group project.

Students' responses in the post-questionnaire were also similar (see Appendix7: statements 9 and 10). The students in group A responded more positively than group B to the statements about their own responsibility and peers' responsibility. Regarding the statement, 'I made a serious effort to fulfill my team role', all the students in group A agreed (1 student strongly agreed, 3 students agreed), whereas in group B 2 students agreed and 2 students disagreed. On the statement, 'I believe everyone in my team took their roles

seriously and contributed fairly’, 3 students in group A agreed (1 strongly agree, 2 agree), whereas 2 students in group B agreed (2 agree, 2 disagree).

8.3.3.3. How online discussion and face-to-face discussion supported collaboration?

The two groups used synchronous online discussion and face-to-face discussion differently. Group A used synchronous online discussion as the main communication medium for project completion because one member lived far away from other 3 students. Group A held 1 face-to-face discussion and 4 synchronous online discussions. In contrast, group B used face-to-face discussion as the main communication medium and synchronous online discussion as a supplementary one for task completion, holding 2 face-to-face discussions and 3 synchronous online discussions. In general, the length of online discussion was longer in group A than group B.

<Table 8.14> The number of online discussion and face-to-face discussion

	<i>March</i>	<i>April</i>	<i>May</i>	<i>Summary</i>
<i>Group A</i>	1 Online	1 Online +1 face-to-face	2 online	1 face-to-face, 4 online meeting
<i>Group B</i>	2 online line	1 online + 1 face-to-face	1 face-to-face (group B displaced online discussion to face-to-face meeting)	2 face-to-face, 3 online meeting

<Table 8.15> The number of lines in online discussions

	<i>1st</i>	<i>2nd</i>	<i>3rd</i>	<i>4th</i>	<i>Total</i>
<i>Group A</i>	326	259	430	365	1380
<i>Group B</i>	179	288	203		670

Although the two groups used the two communication media differently, they showed a common perception of the advantages and limitations of synchronous online discussion and face-to-face discussion. They both appreciated the advantage of online discussion for providing more meeting opportunities by overcoming time and space constraints, but perceived it as limited as an effective communication tool for task completion. Instead, face-to-face discussion was perceived as being more effective for substantial discussion and practical progression of the project.

For group A, unfamiliarity with each other, lack of social context cues and the difficulty of expressing ideas completely in typing may have caused misunderstanding or even conflict.

“Online discussion provides more frequent and regular meeting opportunity by overcoming time and space constraint... however, online discussion is likely to cause misunderstanding and conflicts when members are lack of knowledge or understanding about peers,..., trivial minor words,..., insufficient background explanation of any suggestion can cause misunderstanding in online discussion...” (group A in reflection diary)

Moreover, synchronous online discussion requires speedy interaction in reading other’s messages and typing one’s opinions, so, students who are not accustomed to it tended to

feel stressed.

...for the students who are slow in typing and not literate for computer use, online discussion is difficult...”(group A in reflection diary)

When reading the online discussion transcripts, group A's unfamiliarity with the synchronous online discussion tool and the turn-taking problem caused tension, confusion and frustration. When they started the online discussion, group A frequently experienced problems in the technique of four-member meetings. However, it was not identified whether the problem was caused by the discussion program itself or the students' unfamiliarity with the program. In some cases, they had to stop their discussion to deal with the technical problem. This disturbed their on-going discussion and made students feel frustrated. In addition, group A had difficulty in coordinating the turn-taking when the four members discussed online. When they had a long message to write, the students chunked long messages into 2-3 short messages by pressing the Enter key to signal that the rest of message was forthcoming. However, it was frequently found that one student's message had been interrupted by another student's message, disrupting the continuity of the whole. As a result, readers had to scroll the screen and connect the chunked messages by following the writer's ID. This may have hindered interactive and deep discussion and any shared understanding of what was being discussed. However, this problem was not found in group B's online discussion because the messages which they typed were short and mainly social.

Group B mixed online discussion and face-to-face discussion properly. Except for the decision on the project topic, substantial progress was made in the face-to-face meetings, for instance, sharing prepared resources, deciding the sub-content topics of the project and

dividing tasks. Conversely, the online discussion was used for maintaining students' interest on the project between face-to-face meetings, coordinating face-to-face meetings or for social exchanges. Group B's perception of the merits and limitations of online discussion and face-to-face discussion was similar to group A's.

“Online discussion could overcome the limitation of time and space, so, it made possible to have regular meetings... and it has the merit of keeping members' interest on the project consistently... but, substantial and deep discussion was difficult in online discussion. ...whereas in face-to-face discussion, it was possible to progress the project substantially with deep discussion, so, prompt result could be produced...however, setting meeting time was difficult...”(group B's reflection diary)

The two groups' different uses of online discussion led to different perceptions of the usefulness and comfortableness of their online discussion (see Appendix 7: statements 11-13).

With the statement 'Online chatting discussion was helpful for group project implementation', only 2 students in group A agreed, whereas all 4 students in group B agreed. On the statement 'I felt comfortable to express my opinions in online discussion', all 4 students in group A disagreed, whereas all 4 students in group B agreed.

Therefore, the majority of students in this case study thought that synchronous online discussion was not enough for implementing the group project. Seven students strongly agreed or agreed with 'To implement the group project, not only online discussion but also various ways of communication, such as face-to-face meetings, email and telephone, should be used'.

8.3.3.4. What did students learn from the group project?

Overall, most students perceived the positive educational value of group projects (see Appendix 7: statements 14-17). More than half of the students appreciated the synergetic effect of collaboration by agreeing with the statement ‘I learned more from group project than on my own’ (6 agreed) and disagreeing with the statement ‘If I had done the project alone, I would have done better’ (6 students). Learning benefits included ‘I have learned some ways of working collaboratively as a team’ (7 agreed) and ‘Through the group project, a more friendly relationship was formed among members’ (5 agreed).

Due to the different experiences of group working, group B’s responses were more positive than group A’s on the above statements. However, group A responded more positively than group B to the statement ‘I have learned some ways of working collaboratively as a team’. By experiencing conflicts and difficulties in the group working process, group A seemed to be more reflective of their group process and to have learned more about group working skills such as effective communication and conflict management.

In the group reflection diary, the two groups appreciated the academic learning merits, socio-affective merits, and development of team working skills conferred by group working (see Table 8.16). One difference was that group A emphasized learning related to team-working, whereas group B emphasized topic-related learning.

Although group projects require overhead time and effort for negotiating and coordinating members’ diverse opinions and activities, most students (7 students) did not think the group project was ‘time-consuming and ineffective’.

<Table 8.16> Perceived learning advantages of group project

	<i>Group A</i>	<i>Group B</i>
<i>Academic learning merits</i>	<p>“Active learning opportunity (by searching resources, sharing opinions with others) which usually lacks in general online courses”</p> <p>“Different approaches to the problem”</p> <p>“Sharing opinions and cooperation” (student 1, 2)</p> <p>“In-depth and broad learning opportunity” (student 4)</p>	<p>“Project topic related knowledge (student 5),</p> <p>Realized ‘the merits of collaborative learning’ (group reflection diary).</p> <p>“Expansion of knowledge base by sharing information” (student 6),</p> <p>“Compensate for each other’s opinions (student 8).</p>
<i>Team-work skills</i>	<p>“Learning about how to coordinate group members’ different perspectives and approaches”</p> <p>“Ways of problem solving together” (student 3)</p>	<p>“Cooperation”</p> <p>“Responsibility”</p>
<i>Socio-affective merits</i>	<p>“Opportunity to build sense of community or intimacy with peers”</p> <p>“Getting stimulus and motivation from peers”</p>	

8.3.3.5. Barriers to (online) group projects

Difficulty in arranging online meeting time

Although online discussion provided a flexible meeting opportunity, in practice, students did not find it easy to choose a common time to meet online and synchronously, due to their busy schedules. Therefore, both groups (in the group reflection diary) stated

“Arranging meeting time” as a difficulty in a group project task. One thing to note was that they gave priority to other work over online discussion when they negotiated their online meeting time. This attitude seemed to be influenced by the perception that they could meet online at anytime. Consequently, groups’ online discussions were held at night.

Communication problem

For group A, communication related problems were a big challenge; members cited *“the misunderstanding and conflict in online discussion”* or *“the difficulty of compromising different opinions”* and group members’ *“passive or egoistic attitude”*.

Lack of resource, free-riding

For group B, *“lack of resources on UCC”* (because ‘UCC’ was a newly emerging area) and *“free-riding”* were perceived as problems.

<Table 8.17> **Barriers to effective group projects**

<i>Common barrier</i>	<i>Group A</i>	<i>Group B</i>
<p>Arranging meeting time</p> <p>“Difficulty in scheduling meeting time, planning with other online learners who takes online course to overcome time and space limitation” (student 4)</p> <p>“Time and space constraint for online distance learners” (student 6)</p>	<p>“the misunderstanding and conflict in online discussion”</p> <p>“the difficulty of compromising different opinions”</p> <p>“passive attitude relying on others”,</p> <p>“Egoistic attitude, too sensitive attitude to get a good grade”</p>	<p>“lack of resources on UCC”</p> <p>“lack of responsibility, free-riding” (2 students)</p>

Perceptions of the group project assessment

All students agreed that the group project assessment should consider diverse components (such as individuals' efforts, team working process and quality of outcome) rather than only assessing individual effort or group outcome. However, the two groups' responses were different with regard to group-based assessment vs. individual-based assessment, reflecting their peculiar group dynamics (see Appendix 7: statements 18 - 20).

More of Group B disagreed on group based assessment (3 disagreed, 1 agreed) and more agreed on individual-based assessment (3 agreed, 1 disagreed). This response may have been influenced by uneven contributions from the members. When there is an uneven division of work, students would prefer individually-based assessment to group-based assessment to ensure a fair reward for their contribution.

Group A was evenly split on group-based assessment (2 agreed, 2 disagreed) but more of them disagreed on individual-based assessment (1 agreed, 3 disagreed). Group A may have realized that group-based assessment bonded them together in the work, although they undoubtedly experienced conflict and difficulties.

8.3.3.6. The module tutor's perspective

The module tutor said that she had adopted the group project assignment for the purpose of providing the pre-service teachers with first-hand experience of collaborative learning. She evaluated her purpose as achieved 100%. She also judged the quality of group project outcome to be much better than that of the individual assignments in the previous term; there was a big difference in the quality of individual assignment. Therefore, she intended

to give 'A' grades to all the participating students. With regard to her role in the group project, she said that she tried to listen to students' problems and difficulties and gave advice to help them solve their problems in the face-to-face classroom sessions. The online teaching assistant, according to the module tutor, had been very supportive to the students by using SMS. She went on to say that what is important for the success of a group project is a topic in which the members have a common interest; good leadership; and active guidance and motivation from the tutor.

8.4. Discussion and comparison of the two group projects

In the following, the commonalities or differences in the two case studies were compared and contrasted with regard to students' collaboration patterns and perceptions of their group project experiences. This leads to some suggestions for effective conditions for group projects.

8.4.1. How did the students work together in the group project task?

Although the two case studies were carried out in different learning cultures and with different course modes (the UK campus-based course vs. the South Korean online distance course), there were some commonalities in the students' collaborative interaction patterns.

First, both cases reveal that the effectiveness of reaching consensus on the main issues was a more critical component of successful collaboration than was individual accountability. This may be influenced by the availability of supporting computer tools (an online discussion transcript or Wiki history) which archived the students' collaboration process, making it possible to identify individuals' contribution level to the group task.

The more successful groups reached consensus on the main issues easily and harmoniously, allowing them to progress to the next stage in a timely manner, and this in turn enabled them to allocate time adequately for each stage of working. Therefore, the final product had a more unified form in which the sub-contents were coherently interconnected with each other and members felt more satisfaction with the process of group working and with their product.

However, the less successful groups had problems in reaching consensus, for example,

personality clashes and overheads in time and effort, what Yamane (1996) calls ‘the transaction cost’. Consequently they could not make timely progress to the next stage. For example, in the South Korean case, the less successful group took too long to decide the task topic and research plan and so ran out of time to coordinate the whole after the phase of individual work. Similarly, most students in the less successful group in the UK case perceived that the group project task was taking up too much time in coordinating members’ different ideas. The failure in effective negotiation impaired the unity of the outcome and lessened the members’ satisfaction with their group working process.

In the group project task, effective completion of the given task within a scheduled time is one of the main goals, as well as learning from working together. Therefore, members have to reach consensus at proper time in order to manage their time for the whole task effectively. According to Gersick (1989), groups experiencing difficulties in reaching consensus cannot proceed to the next stage of work, due to confused and repetitious discussion with no concrete results.

Second, negotiating and reaching consensus were easy when members created a positive group atmosphere. The more successful groups created a different group atmosphere from that of the less successful groups.

The members in the more successful groups commonly displayed a positive and respectful attitude toward other members’ ideas and personal harmony, expressed by the students in terms of being “open minded, good listener and compromising” (in the UK) or “fitting well with each other” (in South Korea), and in this way they found it easy to built comfortable and friendly relationships. This positive group atmosphere influenced task-related collaboration positively (early and easy consensus on the task plan) and successful

collaboration in the task enhanced their relationship by eliminating the pressure of the task itself.

However, in the less successful groups, some competitive attitudes and anti-cooperative behaviours were witnessed, such as seeking to dominate, refusing to compromise and expressing differences of opinion bluntly rather than tactfully. This made the group's atmosphere uncomfortable from beginning to end. Hence, it was hard to reach consensus because members became defensive and less responsive to one another's ideas. The difficulty with task-related issues aggravated their relationship by causing negatively affective group reactions such as tension, antagonism, frustration, and anxiety.

Therefore, relational aspects and task-related collaboration influenced each other in a cyclic way, as Simons and Peterson (2000) report. Researchers argue the importance of trust building, group cohesion and a sense of community for successful collaboration (Wegerif, 1998; Simon and Peterson, 2000). When members lack a sense of community and trust, task-related disagreements are likely to be misinterpreted as personal attacks and transform easily into relational conflict (Tjosvold and Deemer, 1980; DeDreu and Weingart, 2003; Jehn, 1995; Simon and Peterson, 2000). However, building a positive group relationship is not an easy task because groups composed by the tutors' choice may unintentionally affect members' personal harmony. In South Korean case, the atmosphere of each group seemed to be built at the beginning and not to change as time passed.

Third, task-related conflict did not function positively on the group process and group outcome because members could not resolve the conflict constructively. Many researchers contend the positive effects of task-related conflict on group performance (Putnam, 1994; Fiol, 1994; Baron, 1997), although De Dreu and Weingart (2003) report negative

correlation between task-related conflicts and group performance. According to them, task-related conflicts help members identify and understand the issues involved and encourage members to develop new ideas and solutions. However, task-related conflicts do not always seem to benefit task performance. For positive impact, the diverse and conflicting perspectives should be resolved constructively as a group solution at the proper time. According to Jehn (1995), task conflict has an optimal level for exerting positive influence. When task-related conflict exceeds the optimal level, the conflict interferes with group performance because members become overwhelmed with the amount of conflicting information and lose sight of the main goal of the discussion.

Fourth, members in the less successful groups in both cases had too divergent ideas to be compatible in one framework, and thus found it difficult to resolve them constructively (for example, the infant area vs. the adolescent area for the task topic in the South Korean case; 'too many ideas' in the UK case).

The group which experienced task-related conflict (when choosing a task topic) in the South Korean context seemed to adopt a compromise or an intermediate position. Thomas and Kilmann (1974) suggest five strategies of conflict management in organizational work groups: avoidance, accommodation, competition, collaboration, and compromise. According to them, compromise behaviour is characterized by acknowledging differences in preferences and then working toward some intermediate position.

The compromise strategy seems to be reasonable, because it considers both sides' opinions equally and instead of forcing its own opinion on the other side, each side makes concessions. However, it is not always effective, because the group project task requires one coherent and interconnected outcome. Persisting in trying to accommodate two widely

different topic areas made it hard and time-consuming to focus activity toward a single interconnected whole. However, in the UK case, the method of negotiation was not identified due to a lack of access to the face-to-face collaboration process. One clue was a student's description: 'took back seat not treading on other's toes', implying that the students avoided taking the initiative to resolve the conflict. When members' ideas are too diverse, accommodating every member's ideas (in order to avoid conflict) may hinder the coherence of the final outcome. Both groups asked for external help (tutor intervention) or suggested the need to have a leader.

Fifth, project groups commonly involved group members' working together (the collaborative approach) and individuals working by dividing the task (the cooperative approach); so, project tasks were changed to 'hybrid mode of group task' (Wageman, 1995) in which individual members did their own portion of work independently and collaborated on some larger shared task (e.g., planning of the group task). The group tasks in the two cases required task interdependence, which meant that the individual parts had to interconnect coherently to form a unified product. Therefore, the group members discussed and negotiated to reach consensus on the lesson plans (in the UK case) or the research plans (in the South Korean case). After reaching consensus on the plan for their project, groups commonly divided the whole task into sub-tasks for individuals to work on. Working completely jointly on the whole process together in small groups of 3-6 members is not realistic. In a small group situation, an autonomous division of work seemed to be unavoidable to ensure the individual members' ownership of the task and effective completion in a given time.

Therefore, any definition of activity that divides 'collaboration' and 'cooperation' cannot

accurately describe students' interaction patterns in these kinds of learning contexts. Rather, the two concepts could both apply to different stages of group working and what mattered was how and how well the two approaches were mixed in each case and at each stage. By integrating the two approaches, members could learn from each other and arrive at better solutions than they might have arrived at if they had worked only independently, yet individuals need high personal control over some portion of work.

Sixth, another issue in comparing the two cases is whether there is any difference in students' collaboration patterns influenced by their different learning culture. The Asian-Confucian culture emphasizes group effort over individual effort, while the Western culture prefers individual efforts to group effort. Therefore, there is more possibility of group harmony and less social loafing in the South Korean case than the UK case. When simply comparing the students' collaborative interaction patterns, it was difficult to find any distinct evidence of cultural difference in their group harmony/ conflict or the social loafing in groups. These aspects seemed to be more influenced by individual group members' attitude and group dynamics than by broader cultural differences.

Last, when comparing the two cases, students' perceptions of their group project experience was more positive in the UK campus-based course than the South Korean online distance course. Various contextual mediating variables could have influenced this difference; for example, group members' previous group work experience or their communication skills, the features of tasks, the extent of tutor support, communication medium, different learning culture, group size, and so on. However, one critical mediating variable for successful group projects seemed to be the opportunity to discuss face-to-face. This was supported by the South Korean case: the group which used face-to-face

discussion as the main communication medium evaluated their group project experience more positively than the group which mainly used synchronous online discussion. Face-to-face discussion seems to be a more effective communication medium than synchronous online discussion for negotiation and making decisions (Bennett, 2004; Straus and McGrath, 1994). This aspect will be explored in the following section (8.4.3).

8.4.2. Students' learning from collaborative group project

In both cases, students realized that the group project task had a range of learning merits: learning about the task topics through sharing and adopting diverse perspectives, developing team-working related social skills and socio-affective advantages such as getting stimulus or motivation and building friendships.

Although most students confirmed the above merits in both cases, the strength of positive response reflected each group's working dynamics. In the UK case, most students (74%) perceived that the collaborative group project helped them learn more than learning alone. However, four students (out of 6) in the less successful group disagreed. In the South Korean case, the more successful group's perception was more positive than the group which had problems (of the 4 members, 3 agreed in the former group while 2 agreed in the latter group).

8.4.3. How did technology support the students' collaboration and learning?

In both cases, students had somewhat mixed perception about the usefulness of the adopted technology for supporting collaboration. In the UK case, 54% disagreed with 'Using FlexWiki helped me to collaborate' and in the South Korean case, 2 students (in the group which used synchronous online discussion as the main communication for task completion)

disagreed with the statement 'Online discussion was helpful to the group project'. Students' perceptions seemed to be influenced by the way in which the adopted technology was used and how skilled they were with the technology.

In the UK case, the Wiki was appreciated as a database for sharing individually developed resources between members and as a showcase to others. Since members could meet face-to-face, they did not use Wiki as a main shared working space or communication tool. Instead, they used more reliable and familiar communication tools as email, phone or MSN. This same pattern of use is also found in other research (Nicol and MacLeod, 2004; Sikkel et al., 2002), in which shared work space was most preferred and most widely used for the archiving of developed resources and the reviewing of others, however, the functions of co-authoring, discussion and communication were not widely used.

In the South Korean case, synchronous online discussion provided more frequent meeting opportunities for the online distance learners; however, its features limited its efficacy as the sole medium for task completion. According to the students' perception, online discussion was useful as a supplementary communication tool between face-to-face meetings for maintaining interest in the task, checking progress or social conversation. In contrast, face-to-face discussion was perceived to be more effective for substantial progress on the project. This coincides with Bennett's finding (2004) that face-to-face meetings are more effective for negotiating ideas and solving problems.

Text-only media and speedy interaction limited the full expression of members' ideas and the in-depth exploration of the ideas of others. In addition, a four-member synchronous online discussion caused some chaotic messages sequences due to the interleaving of turns, putting a strain on maintaining coherence and on-topic discussion, in accordance with

Herring's (1999) finding. It could be argued that there is a poor task-technology fit between online discussion and negotiation or consensus building tasks, as McGrath and Hollingshead (1993) find. This raises doubt about fully online project groups which are obliged to communicate only online. However, it is also possible that practice in using the medium together with tutor support could in time overcome some of these difficulties, since some authors report improvement in coherence, focus and constructive engagement with each other's ideas as participants become more familiar with chat (Walker and Pilkington, 2001; Pilkington and Walker, 2003).

Another supporting function was that the recording feature of Wiki and the online discussion transcripts let students review their group activities and reflect on their own and other people's work. This could function as an implicit feedback, helping to regulate their working progress and the quality of resources. For example, the Wiki provided easy access to other members' or other groups' resources, enabling students to compare the strength or weakness of the multiple representations and by this means get more ideas and understanding of ways of using ICT for teaching. The visibility or comparability of individual contributions to the group task may also help to enhance individual accountability by preventing social loafing or free-riding (Janssen et al, 2006).

8.4.4. Conditions for effective collaboration

Group size

Groups contained 5-6 members (the UK) and 4 (South Korea). Depending on groups, there were problems of information overload (in 5-6 member groups), division into two sub-groups and conflict between two parts (in a four member group), uneven contributions

between members, and the difficulty of coordination. In both cases, students preferred a smaller group size; 2-3 members, because of easier coordination.

Therefore, when deciding the group size, the complexity of the task and the characteristics of the communication media should be considered. If synchronous online discussion is used for distance learners, smaller groups will be better for coordinating turn-taking and scheduling meeting time. As group size increases, the online chat discussion may become more chaotic and difficult to coordinate.

A complex task requiring diverse skills and knowledge should be allocated to a group large enough to include these (Thelen, 1949; Johnson, Johnson and Holubec, 1994).

Task characteristics

The group task in the South Korean case was more open than in the UK case. The South Korean groups' task was to choose a topic relating to the module content, research the topic as a group and present the outcome. The group task in the UK case was to design and deliver geography lessons with the aid of ICT and the task topics and the student subject to be taught were decided by the placement school mentors.

In the South Korean case, one group easily reached consensus on the topic, but the other group found this hard. Deciding a task topic depends on members' preference or interest, so different opinions cannot be easily resolved by searching for more information or the critical evaluation of alternatives. If the group task had been more structured (or the task topic had been provided), the group might have had less difficulty. Note that there is a perceived trade-off here (by tutors) in allowing students to pursue their own interests and develop autonomy-the first is important for engagement but the latter is important for

learning to learn. Too much structure or tutor involvement could adversely affect both.

Assessment

For success in collaborative group projects, members should be responsible for doing their own portion and should try jointly to coordinate these individual efforts to produce a high quality final product.

In the UK, the group task was not directly graded. Instead, on completion it was peer-reviewed. By informing students of the peer-review opportunity, individual students' accountability could be influenced positively.

In the South Korean case, both the group product and the group process were assessed for the final grade; the quality of the group product took 40% of the whole and students' participation in the group process took 20%. The emphasis on product quality seemed to promote the groups' efforts to plan together and coordinate individual contributions to develop a unified final product. The fact that the group with problems continued to discuss and negotiate, despite their obvious confusion and conflict, seems in particular to derive from the weight given to product quality. Assessment may also have encouraged two students to take a more strategic rather than an interest-based topic choice (preference for the easier subject).

In both cases, students' perception indicated that they preferred an assessment method which considers diverse aspects, such as product quality, the collaboration process and individual contributions rather than a single group-based assessment or an individual contribution-based approach. Johnson and Johnson (1989) suggest that one way of ensuring individual accountability and group accountability is to assess individual effort

and group effort together.

However, the problem is in practice to assess those aspects; for example, how to assess individual accountability or group effort or what proportion of the marks should be distributed between those aspects. Although diverse types of group project assessment are suggested, each method has practical limitations. For example, when all members of the group receive the same grade, without all members contributing equally, students complain that the assessment is unfair. In order to distribute the grade according to individuals' contributions to the project, each one's contribution level should be identified. For this purpose, peer assessment is suggested, because members are more knowledgeable about their collaboration process. However, peer assessment is criticized for the contradiction between a learning process of working together to help each other and an assessment process which inhibits collaboration by making peer students assess each other (Kennedy, 2006).

In relation to assessment, one advantage of a computer supported group project is that the archived data (on the Wiki site or in the online discussion transcript) makes it easier for the tutor to identify an individual's contribution to the project or the collaboration process (although this assumes that one person is not doing the work on behalf of the others).

Assessment exercises power and control over students' approaches to learning because students quickly respond to it by regulating their learning activity accordingly (Entwistle, 1997). Therefore, inappropriate forms of assessment can distort students' behaviours in collaborative learning. Consequently, the assessment criteria should match the purpose of adopting a group project.

Technological issues

In both cases, students experienced technology-related problems: these related to the program itself (unstable connection, limited function) and to users' unfamiliarity with it.

In the UK case, the main limitations were the lack of robust off-campus access and user-unfriendly interface in relation to the students' ICT skills. The unreliable system made students frustrated and led to their avoiding it in their working processes. Students' unfamiliarity with the Wiki syntax limited their actual use of it, even when they could access the Wiki site. Given the students' ICT-related skills, one hour's instruction was not sufficient.

In the South Korean case, two groups also experienced technical problems in using their chosen synchronous online discussion program. Four-member online discussion at first excluded some students from meetings and sometimes the online discussion was disconnected in the middle of discussion. Some students appeared unfamiliar with the functions of online discussion programs and this caused anxiety.

Clearly, any technology chosen to support learning and collaboration should guarantee stable access and sufficient instruction time in its use. When the adopted technology creates problems or students find difficulty in using the technology, they cannot focus on the task. In this case, the adopted technology influenced the collaboration process negatively.

Tutor's role

Designing group tasks, monitoring group processes and intervening when necessary are suggested as being the tutor's functions in collaborative learning (Oakley et al., 2004; Yamane, 1996). The supporting computer tool's facility (the online discussion transcripts and the archived data on the Wiki site) makes it possible to monitor group working process and detect any problems in groups.

In both cases, the two module tutors said that they had monitored students' collaboration process, however, they seemed not to intervene actively when some groups experienced difficulty. This might imply the difficulty of proper intervention in students' group processes.

From the students' perspective, the most urgent role for the tutor is to give sufficient support when they experience problems and cannot resolve them by themselves. However, displaying proper intervention is difficult because students have control over their interaction and may not alert the tutor to the fact that they are having problems. Tutors may lack practical intervention skills or students may not accept tutorial suggestions. Or the problems which they have experienced may already have impaired the members' group relationship.

Therefore, prevention may be better than treatment. Before starting collaborative group work, tutors should provide students with training opportunities for group or communication skills, guidance on the problems and mistakes which new groups commonly experience and ways to avoid or deal with the problems (Oakley et al., 2004; Johnson et al., 1989; Prichard et al., 2006).

Student characteristics

Students in the UK case had homogeneous demographic backgrounds in nationality, study area and age group. However, the groups worked together with different degrees of effectiveness. In the South Korean case, the group with more homogeneous backgrounds (in the study and work area) found reaching consensus more difficult than the other group did. A more important element than homogeneity seemed to be members' attitude and effective communication skills (although even harmonious groups which demonstrate little conflict and are cohesive may not always produce the best outcome, as their harmony may limit criticism. As Mercer (1995) found, talk can be 'cumulative' rather than 'exploratory'). The members in successful groups commonly had mutually respectful and cooperative attitudes.

Students' previous experience of collaborative group working is also important. As group working experiences accumulate, students can develop interpersonal skills such as effective communication skills, conflict management skills and decision making skills (Colbeck et al., 2000).

Shared leadership

Group tasks require coordinated effort and management of the group process. In the UK case, the role division was not marked. However, three groups (out of 6) suggested the need for a leader. In the South Korean case, the degree of role division and agreement on roles differed between two groups. In the successful group, all the students shared some roles, whereas in the less successful group, only two students (out of 4) took functional roles and members seemed to disagree on leadership. By taking roles in the working

process, members can assume more responsibility and ownership of the whole group task (not only their own work) and effectively manage their group processes. Yamane (1996) contends that dividing the roles and responsibilities within groups can reduce the transaction costs associated with working as a group.

Having completed these four cases and compared and contrasted them in pairs, I review in the final chapter what has emerged in relation to confirming or discrediting existing models of collaboration, the common factors which impact on collaboration across cases and the recommendations for practice which these suggest. Finally the limitations of the research are discussed in relation to the emerging themes for further research.

CHAPTER 9

CONCLUSION

The purpose of this research was to explore whether CSCL can be an effective instructional method for developing higher order thinking skills including communication skills and team-working skills and to suggest conditions for effective CSCL. To this end, four case studies were conducted for the in-depth investigation of student collaborative behaviours, their perceptions and the mediating variables impacting on the collaborative behaviours in the four CSCL contexts.

The four cases are located in different learning culture (the UK, Western culture vs. South Korean, Asian Confucian culture), different course mode (on-campus courses supplemented by ICT tools vs. online distance courses with a few face-to-face sessions), different technologies (asynchronous online discussion, Wiki, and synchronous online discussion), different group tasks (group discussion vs. group project) and other local learning contexts. However, the comparison of the four case results has revealed some common principles, irrespective of the different learning contexts.

From the four sets of case results, this chapter presents the emerging commonalities in the students' collaboration patterns and perceptions and their implications for theory and practice. Finally, the strengths and limitations of the research and recommendations for further study are presented.

9.1. Students' collaborative interaction patterns in CSCL

9.1.1. Individual accountability vs. group effort

Collaborative learning is not simply the sum of individualized learning, but involves some synergetic learning effects caused by group processes such as sharing ideas and information, discussing and negotiating members' diverse ideas, and socio-affective support of each other's efforts. For successful collaboration, there should be a balance between individual accountability and group effort.

Overall, students seemed to put more effort into doing the work for which they were individually accountable rather than toward a collective effort in collaborative learning. This can be translated into putting more effort into individual meaning-making rather than social meaning-making in asynchronous online discussion, or individually doing one's own portion of work after planning it together in the group project. However, the degree of group effort was higher in the group project tasks because of the higher degree of task interdependence (this aspect will be discussed further later in this chapter). This could be due to intrinsic human nature or to students' familiarity with conventional individualized learning.

Individual accountability is higher when people's roles or responsibilities are clearly defined, making their contribution level easily identifiable for the assessor. When individuals have a clear working boundary, they can have more autonomy and control over the task and therefore can have more task ownership and thus put in more effort. Conversely, when an individual's working boundary is not clearly defined and each one's contribution to the group outcome is not easily identifiable by others (in particular, by the

assessors), individuals are likely to put less effort into group work than into individual work (social loafing) because they cannot be sure that their contributions will be rewarded fairly in proportion to their efforts (Williams, Harkins, and Latane, 1981).

In the asynchronous online discussion, the individual's contributions to the discussion were easily identified because students participated in the discussion with their real identifier. Moreover, students have more autonomy when constructing their own perspectives than when giving comments on their peers (because the former does not require coordinating an individual's cognitive thinking process to that of others; for this reason, the former is easier than the latter), or perhaps because an individual perspective is a pre-condition for making comments on others.

In the group project task, the division of work implies that students want to take clear responsibility for or ownership of a task by defining their individual working boundaries and responsibilities. Although the wiki collaboration requires group ownership of the Wiki resource for active co-construction, students did not edit the work of any other member. Students may have lacked motivation or knowledge or they may have wished not to interfere with someone else's work because they would see it as impolite - trespassing on someone else's working boundary, as already defined when the work was divided up.

The problem is that collaboration requires more than everyone's doing his own portion side by side with others. For new learning to occur through group discussion, individuals' initial perspectives should be changed to group-level shared knowledge through the negotiation process. In order to collaborate well in group project tasks, members need to build a task-specific consensus or common ground by a process of negotiation. However, students' collaborative interaction patterns in the four cases revealed that the social negotiation

process to reach consensus was weak (in asynchronous online discussion) and the most difficult aspect (of group project tasks).

9.1.2. The mechanism of reaching consensus

When comparing the four cases, two ways of reaching consensus (or shared understanding) were found. One is that some members seem by chance to have similar perspectives on the given task before collaboration and keep these perspectives after engaging with their peers' opinions (finding each other's shared understanding through collaboration). The other is that members gradually reach consensus by resolving different or conflicting perspectives through a discussion process (constructing shared or new understanding as a result of collaboration). The latter is a great deal more expensive in terms of cognitive effort than the former and although it may be prized more when it works, time constraints may make it difficult to achieve (a point raised again later).

For example, in the South Korean asynchronous online discussion, students' comment on peer opinion was predominantly agreement. They found that they shared an understanding when they came across similar opinions from their peers. Although there was no transformation of initial perspective, there was affirmation through other members' agreement. In addition, students did not simply agree in most cases, instead, they added personal reasoning or information as evidence of agreement. Therefore, students could enrich and supplement each other's understanding and knowledge. This process of reaching consensus was similar to 'cumulative talk' (Mercer, 1995), in which discussion partners build positively but uncritically on what the other has said through confirmation and elaboration.

This process is different from the shared understanding construction process in which group members' different opinions are negotiated and modified, to gradually form a newly integrated shared understanding as a result of collaboration. In fact, the latter way of reaching consensus was rarely found in asynchronous online discussion because individual students participated only once in a threaded discussion; therefore, on-going negotiation of different opinions did not continue to the point of consensus. In the UK asynchronous online discussion, there were a few cases in which a participant student's initial perspective was taken up, elaborated and enriched through peers' critical comment. However, the evidence of reaching consensus was not clear, because the discussion ended without explicit evidence of conclusion (because verbal back channels or brief utterances indicating agreement were not expressed at the end of discussion). This way of reaching consensus is similar to Mercer's (1995) 'exploratory talk', in which discussants engage critically but constructively with each other's ideas.

In group project tasks, the more successful groups in two cases seemed to reach consensus more easily because members had similar or harmonious ideas. In contrast, the less successful groups had difficulty in reaching consensus because members' ideas were too divergent, so, could not be easily integrated into a shared plan of the task. For example, in the South Korean case, the more successful group reached consensus on deciding the task topic because members had similar interests or preferences, while the less successful group could not reach consensus because the members' preferences were too divergent (effective completion vs. learning value).

Overall, reaching consensus in the four cases was easier when members began with similar or harmonious ideas, as might be expected. Although divergence in ideas helps students

For example, in the project groups, reaching consensus on the task plan was not the goal but merely one process to pass in order to complete the task. In addition, the UK project groups had to complete the task in a week. This may have imposed pressure to reach consensus in proper time, considering the whole schedule allowed for the task. Therefore, they may have reached consensus, only because the decision was acceptable or the individuals' perspectives were compatible with all the others'.

These issues raise doubt about the need to reach consensus as a critical component of collaborative learning (in particular, computer supported collaborative learning). It should be noted that there is a contradiction between the constructivist epistemology and the requirement of consensus building in collaborative learning. Basically, constructivism is premised on the assumption that there are multiple representations of reality. Therefore, there has been a criticism that the emphasis on reaching consensus can suppress differences in ideas and enforce conformity (Trimbur, 1989). Dillenbourg et al. (2007, p. 3) also draws the criticism that "there is an illusion of convergence" in collaborative learning.

9.1.3. The importance of socio-affective aspects for students' collaboration

In the collaborative learning process students' cognitive aspects and socio-affective aspects are intertwined. However, more emphasis in collaborative learning research has been placed on cognitive processes than on socio-affective aspects; this being the case, Dillenbourg et al. (2007) contend that affective issues are a somewhat neglected aspect of CSCL.

My impression in the four cases was that there were many socio-emotional aspects operating under the surface, which hindered or motivated certain behaviours. More

expression of agreement and lack of critical comment in the South Korean asynchronous online discussion and students' very careful and roundabout expression of critical comment in the UK asynchronous online discussion reflected this attitude on the part of students. In the case of the two group project tasks, groups which faced conflicting opinions commonly experienced more dissatisfaction than did groups with more agreement on task issues. As this research and Davies (2004) have found, students were reluctant to edit each other's work.

Theoretically and cognitively, exposure to different perspectives can contribute to expanding one's own perspective and a better solution for the group; however, from a practical and emotional standpoint, receiving critical comment or disagreement may not be a pleasant experience. People's normal affective reaction to any form of disagreement or critical evaluation is negative, for example, frustration and dissatisfaction, regardless of outcome (Ross, 1989; Baron, 1990). Therefore, task-related conflict is likely to be changed to relational conflict. Researchers find that task-related conflict and relational conflict are consistently co-present (Simon and Peterson, 2000; De Dreu and Weingart, 2003). Then, how to enhance the positive effects of task-related conflict and reduce the negative effects in the relational aspect?

As to the linking mechanism between task-related conflict and relational conflict, Simon and Peterson (2000) find that intra-group trust is a critical mediating variable. When group members build trust in each other, they will be more likely to accept stated disagreement at face value and less likely to misinterpret it as a personal attack or humiliation. In contrast, when group members do not trust each other, they are likely to interpret other's critical or conflicting perspectives negatively and infer relational conflict as a plausible explanation

for them. Trust can be defined diversely. According to Rousseau et al. (1998, p. 395), “Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another”. Tjosvold and Deemer (1980) similarly find that open discussion seldom leads to relational conflict when participants are cooperatively oriented. Issroff and Soldato (1996) argue that members’ level of mutual respect and willingness to work together (social affinity) have a significant effect on the nature and effectiveness of collaborative interaction.

The problem is how to build trust and create a positive group atmosphere. Some groups seemed to develop strong bonds and trust, despite heterogeneity and short time spans, whereas others may not, as was found in the South Korean project groups. Team members may like or dislike one another for personal reasons. However, group members’ personal relationships are not influenced by training. Exchanging social conversation is one suggestion for helping trust building (Benfield, 2002). When group members get to know one another more, mutual understanding increases and interpersonal conflict may weaken. For example, the more successful group in the South Korean case exchanged personal and social conversation consistently, while the less successful group rarely communicated social-personal topics.

Group members’ effective communication skills are also important for reducing the negative effect of task-related conflict. According to Simon and Peterson (2000), task-related conflict is likely to involve harsh and raised voices which hurt other people’s feeling. If different opinions or critical comments are expressed too directly or bluntly, the negative feeling caused can hinder more discussion. If they are expressed more tactfully and constructively, showing care for the other people’s feelings, there are more possibilities

of acceptance and constructive discussion without flaming or conflict. Therefore, students have to learn effective communication skills.

9.2. Mediating variables influencing collaborative interaction patterns and their implications for course design

As other researchers have found, students' collaborative interaction patterns were influenced by diverse mediating variables and their interactions (Benbunan et al., 2004; Lipponen, 2002; Sloffer, Dueber and Duffy, 1999). The four cases are different in the types of task, learning culture, course mode, and technology used. In the following, the impact of these differences on students' collaborative interaction patterns is discussed and the implications for effective course design are suggested.

9.2.1. The influence of different group tasks

This research included two different types of group task; asynchronous online discussion (cases 1 and 2) vs. a group project task (cases 3 and 4). They were different in the extent of task interdependence. The group project task, which required a group outcome needed a higher degree of member interdependence than group discussions which did not require a group level conclusion. In order to produce a group outcome, members have to discuss diverse ideas to reach consensus on the overall plan and closely coordinate members' actions and scheduling in their working process. For this reason, there is more possibility of encountering problems. Comparing the collaborative interaction patterns in asynchronous online discussion and a group project task, conflicts occurred in the group project task in both cases, while there was no conflict in the asynchronous online discussions.

In asynchronous online discussion, students can participate independently at their own pace. They also have more control and autonomy over participation and interaction. They can decide whether or not to participate, what kind of message to post; to respond to the discussion topic or comment on peers. Yet these freedoms can also cause the difficulty of a coordinated outcome in asynchronous online discussion and can result in discussion which is actually more like serial monologues than on-going, interactive discussion.

Overall, when the degree of task interdependence increased, the amount and intensity of interaction among the group members increased. Too little task interdependence may result in a very low level of interaction among group members, thus preventing mutual learning opportunities and other socio-affective learning benefits. In contrast, a high level of task interdependence may raise the level of coordination to the point where its cost outweighs its benefits because much energy may be expended in regulating members' collective behaviors which might otherwise be expended on task performance. Therefore, the optimal level of task interdependence should be determined by considering the learning benefits and its costs (in particular, students' available time, the characteristics of the communication media, members' group task preferences, etc.)

9.2.2. The influence of cultural difference

The four cases are situated in two different cultures; Western culture (cases 1 and 3) and Asian-Confucian culture (cases 2 and 4). As globalization increases, the number of students who study in a different culture (in particular, the Asian students who study in Western countries) is increasing. Moreover, the development of ICT has overcome the national boundaries of teaching and learning, so, the provision of global or cross-cultural e-learning courses are increasing. Competition for the e-learning market is increasing and the

potential of the higher education e-learning market is vast (Fry, 2001). Therefore, researchers are gradually becoming interested in cultural differences in students' engagement with e-learning tools and suggest the need of culturally-sensitive e-learning course design (Selinger, 2004; Merryfield, 2003; McLoughlin, 2000). Previous research in Western classroom settings found differences in learning and communication styles between the students from the two cultures (Morse, 2003; Tweed and Lehman, 2002; Tucker, 2003; Biggs, 1996; Littlewood, 1999). Western learners are reported to be more self-directed or student-directed in the learning process, see teachers as guides or facilitators of their learning, are active in expressing personal hypotheses and open to criticism and confrontation due to the influence of individualism. In contrast, Asian-Confucian learners are passive and silent in classroom discussion, respect teachers as an authority, accept their instructions without questioning and may thus lack critical thinking skills and be prone to seek harmony in discussion due to the influence of collectivism.

Are these different learning styles similarly found in e-learning classes? Or do different learning contexts cause changes in the students' stereotypical learning styles in the two cultures?

Some empirical research has been conducted to compare interaction patterns between students from different cultures in computer mediated communication (Liang and McQueen, 1999; Kim and Bonk, 2002; Yildiz and Bichelmeyer, 2003; Reeder, et al., 2004). Research findings still support the existence of difference in learning style.

The comparison of the students' interaction patterns and perceptions in the two asynchronous online discussions seemed initially to confirm the influence of culture on students' communication patterns. However, the simple comparison of the two cases had

limitations because the students in the UK case had multi-national backgrounds (including Asian students) and the number of enrolled students was too small to infer any general trend.

In the comparison of the two asynchronous online discussions, the South Korean students agreed more than the students in the UK case, while the students in the UK case balanced critical comment and agreement. In addition, students' perceptions confirmed the cultural influence; most of the South Korean students agreed that they were hesitant to give critical comment, while most of the students in the UK case suggested they were not so hesitant. However, caution is needed for this interpretation because most of the students in the South Korean case were females. Several researchers find that females are more likely to express agreement than males (Guiller and Durndell, 2006; Blum, 1999; Herring, 1994).

It may be difficult to deny altogether the existence of different learning styles. However, in the UK case, the role of 'Netiquette' should also be considered. In the UK case, the module tutor posted 'Netiquette' to act as a guide of how to express opinions and how to give comments on peers' contributions. This formed a group norm in the asynchronous online discussion. Group norms guide and regulate members' behaviours in groups. Therefore, students may feel free to give critical comment without the students who draw it interpreting this as personal criticism. In contrast, in the South Korean case, there was no detailed guidance for group discussion. Therefore, the general culture may have permeated and influenced the group norm in discussion. If the tutor provided more detailed guidance on discussion, the typical Asian learning style might change or the influence of culture might be mitigated.

The comparison of the two group project tasks in both cases revealed no important difference in students' interaction patterns. Some groups experienced conflict and disagreement, while other groups completed their task harmoniously according to the nature of the members' relationships. In addition, the study has limitations in drawing any detailed conclusions because the detailed data collection was limited in the UK case and there were only two project groups in the South Korean case.

With regard to students' expectations of the tutor's role, it was difficult to identify any great differences. In general, students' expectations seemed to depend on individual preferences or the group dynamics experienced. In the asynchronous online discussion, the students in the UK case expected more intervention from the tutor than did the South Korean students (although tutors participated more in the UK case than the South Korean case). In the group project tasks, the less successful groups which experienced problems asked for the tutor's support more than the more successful groups which collaborated well by themselves.

Therefore, this study can conclude in only a limited sense that South Korean students and the UK students have distinct difference in learning styles or preferences. This may imply that cultural differences in students' learning styles have been overstated or are changing with the influence of globalization and educational reform policy. As stated in Chapter 2, the aims and directions of higher education reform between the UK and South Korea are similar.

There was evidence that typical learning style differences are diminishing in the computer supported learning environment. For example, the findings in the South Korean asynchronous online discussion indicated that asynchronous online discussion has the

potential to overcome Asian students' passive and silent role in class discussion.

The findings in this research provide some implications for course design. Computer supported collaborative learning environment is different from a face-to-face mode and may therefore have some potential for enhancing student interaction in the learning context. This study also identifies that asynchronous online discussion had the advantage of more equal participation opportunities for international students who have to participate in a foreign language; language issues were critical in a cross-cultural learning context.

Globalization also impacts on the cultural dimension, so, there is a possibility that these two different learning cultures may fuse or converge. In South Korea, the number of academic staff (in higher educational institutions) and students who study in Western countries (in particular, in the USA) has been increasing. This implies that the tutor's teaching models and students' learning styles are being influenced by Western models. Hence, some aspects of convergence may appear in course design and students' learning styles; the influence of culture these days may be weakening.

This converging aspect was found in the course design in all four cases. The four modules involved in this research basically adopted a VLE and showed a diverse blending of learning models and learning technologies.

In case study 1, asynchronous online discussion and other learning technologies (WebCT, Wiki, blog, Webcast) were integrated in face-to-face class sessions in which the tutor combined lecturing with various collaborative group tasks. In case study 2, a few campus-based sessions were integrated into the main online sessions which adopted diverse learning technologies (asynchronous/synchronous online discussion, VLE) and the tutor's

audio-lecturing was blended with group learning activities. In case 3, a Wiki was adopted to support a face-to-face group project task and WebCT supported the campus-based module. In case study 4, 3 face-to-face sessions were integrated into the main online sessions in which the tutor's online lecture was blended with the students' group project task.

These diverse types of blending are in accord with the characteristics of 'the third age' of CSCL, as Dillenbourg et al. (2007) contend. According to them, the third age of CSCL is characterized as "the disappearance of CSCL as a distinct pedagogical approach. Instead, collaborative activities are becoming integrated within comprehensive environments". Here, the tutor's role is to "orchestrate multiple activities (both collaborative and non-collaborative activities) with multiple tools" in both online and off-line space (p. 2)

The diverse blending in the four cases may be partly due to the characteristics of the modules involved in this research. The module subjects were related to studying by means of learning technology or ICT in education, except for case study 3 (in which special technical support was given, as mentioned, due to the newness of the technology at that time and involvement in the Wiki project). Therefore, the module tutors had sufficient expert knowledge and ICT skills in the methods of using ICT for teaching and learning. The students also could have been more proficient in their ICT skills and more motivated to use ICT in learning.

In particular, the research site in South Korea was a specialized post-graduate school for distance learning and the module tutor undertook her PhD program in the USA; therefore, the course design may have been more up-to-date than that for other e-learning courses in South Korea.

9.2.3. The influence of different technologies

The characteristics of different technologies influenced collaborative interaction patterns. When comparing the four cases, online discussion (both asynchronous and synchronous) was more limited when it came to negotiating social meaning and reaching consensus than face-to-face discussion, because of the richness of the media. Rich media have a greater advantage for carrying information and conveying the nuance of statements, resulting in more efficient communication (Daft and Lengel, 1986).

Face-to-face discussion is a rich medium in which participants are aware of each other's facial expressions, gestures and tone of voice. When there is a misunderstanding or ambiguity, immediate clarification is easy. However, face-to-face discussion was not always successful in negotiating members' different opinions, as evidenced in the less successful group in the Wiki project. Rich media can have a contrary effect in being able to transmit negative atmosphere more effectively, which can result in conflict or heated discussion.

Asynchronous online discussion has limitations in negotiating social meaning and reaching consensus, due to the separation of discussants and the text-mode. When participants are located together in one place, they are more likely to engage in their peers' ideas than when they are dispersed and feel one another's presence less keenly. In text-mode discussion, detecting the exact meaning and nuance of statements is more difficult due to the lack of non-verbal context cues. In addition, participants are likely to omit verbal back channels or brief utterances indicating agreement or understanding because they have to log on to the discussion board and type them in order to express them; it is too laborious. Moreover, participants may feel that posting a message which contains only simple agreement or

understanding is too trivial or superficial response. However, these expressions are important for collaboration because back channels are indications of whether or not group members are building shared understanding. At the same time, asynchronous online discussion has the strength of more reflective and critical thinking because there is no pressure to respond immediately. In addition, participants (in particular, introvert students) can participate more actively than in face-to-face discussion with less communication apprehension from no physical co-presence.

In synchronous online discussion, where participants are co-present in time (but dispersed in space), discussion is more interactive than in asynchronous online discussion. However, typing ideas on complex and academic topics in real time imposes a high cognitive load on participants. Due to the speedy nature of the typed interaction, participants are likely to focus on developing and typing their own ideas, which means that they cannot attend to or reflect on other's ideas sufficiently. When coordinating turn-taking fails (in multiple participants' discussion), online discussion becomes chaotic due to interleaving messages (Herring, 1999). Cornelius and Boos (2003) suggests ways of avoiding chaotic discussion; explicit reference to topics and communication partners. However, this is still laborious because participants have to type them quickly. Due to these traits, synchronous online discussion has limitations regarding coherent discussion and in-depth exploration of an issue; equally, negotiation is difficult and reaching consensus generally takes more time than in face-to-face mode (Hollingshead, McGrath and O'Connor, 1993; Straus and McGrath, 1994). However, synchronous online discussion has the merits of facilitating the generation of ideas and building of social community (Gallupe, Biastianutti and Cooper, 1991; Hollingshead et al., 1993; Chou, 2002). Moreover, synchronous interaction can give more opportunity to engage in ways which are more like dialogue and debate than

asynchronous discussion.

As suggested in the above, each communication medium has its own strengths and weaknesses, and thus influences interaction patterns positively or negatively.

According to McGrath et al. (1993), task performance will be improved when the needs of the task are matched to the characteristics of the specific medium, although there is a contrary argument that the training of media-adapted conversation management strategies can enhance coherent conversation (Cornelius and Boose, 2003). Therefore, a more practical and wiser question would be how these diverse communication media can be used to suit different tasks. A combination of diverse communication media should be provided according to the characteristics of the learning tasks, with their strengths and limitations considered and the students should be allowed to mix and match them flexibly to meet their needs.

9.3. Students' perception of CSCL

Is it helpful for online distance learners to provide collaborative learning opportunities which require coordinating their activities with others? Or, is it beneficial for campus-based students who can discuss or collaborate face-to-face to be given computer supported collaboration opportunities?

For the online distance learners in the South Korean case, asynchronous online discussion provided a discussion opportunity which was not otherwise possible. Moreover, the discussion opportunity did not hinder their self-paced and flexible learning. Therefore, their perception of asynchronous online discussion was highly positive.

However, group project tasks which require members to coordinate and regulate their activities and schedule with others may impose much greater psychological and practical burdens on distance learners who suffer from a lack of time to coordinate their studying with other commitments. In particular, when students' collaboration processes experienced problems and difficulties, they perceived the cost required for collaboration as too high compared to the gains from collaboration and their perception of group project work was negatively influenced. However, when students collaborated well, so, students did not perceive the imposition as burdensome and overall perceived the experience much more positively.

For the international students in the UK campus-based course, asynchronous online discussion provided a more active, convenient and comfortable opportunity for discussion with a lowered language barrier. Therefore, their perception was quite positive.

For the native UK students in the UK campus-based course, the perceived benefit of asynchronous online discussion was inconsistent according to individual's experience. If asynchronous online discussion simply replaces face-to-face discussion, they tend not to perceive it positively because they have more effective discussion opportunities (face-to-face discussion; although there can be some students who feel uncomfortable in face-to-face discussions). For their positive perception, the asynchronous online discussion should provide a different kind of enhanced learning experience, which face-to-face discussion precludes. When individual students perceived that the advantages of asynchronous online discussion (e.g., greater depth, more reflective, critical thinking, flexible participation, more comfortable participation and so on) exceeded the costs or limitations (more time and effort in participation, delayed interaction), they perceived asynchronous online discussion

positively.

This pattern is similar to that found in the Wiki project. The project groups could meet and collaborate face-to-face without the support of Wiki. The Wiki program therefore needed to provide a different kind of functionality which was impossible or difficult in face-to-face collaboration. Among the diverse functionalities, students perceived the Wiki to be most useful as a shared resource database or showcase. They could more easily access other members' (or other groups') resources than they could with only face-to-face collaboration. However, most of the students had to learn Wiki syntax and experienced technical problems in using it; these are the costs in using Wiki. Therefore, students' perceptions about the usefulness of Wiki were mixed.

Overall, most of the students in the four cases believed there were learning benefits from the collaborative learning by means of computer tools. Students' self-reported learning benefits were related to the skills and competencies needed for a 'Knowledge society'. The students in the four cases commonly listed various learning advantages: academic and cognitive learning (deep learning about topics, higher order thinking skills such as critical thinking, diverse perspectives), the development of social skills (written communication skills in cases 1 and 2, group working skills in cases 3 and 4), socio-affective advantages (sense of community, added motivation) and other skills such as ICT skills, self-directed learning skills. This implies that CSCL is an effective instructional model for supporting students' learning and developing diverse competencies. However, a note of caution is needed here in that students are perhaps somewhat more likely to self-evaluate their own learning experience more generally in a positive way as this affirms their reason for doing the course.

9.4. Contributions and limitations of this research and recommendations for further research

First, researchers claim a range of learning benefits from CSCL. However, research on whether students perceive these learning benefits from CSCL has been rare. This research shows that students from diverse backgrounds perceived many of these learning benefits.

Second, this research developed a content analysis coding scheme for asynchronous online discussion analysis. The scheme was useful for identifying what types of comments were exchanged in the idea linking stage and the process of consensus building. This was helpful for identifying different interaction patterns in the two different learning cultures and showing whether overall particular forms of collaboration were taking place through discussion media.

Third, in general, the adoption of particular learning technologies to support collaborative learning is usually decided by individual tutors or institutions; therefore, the usefulness of adopting a technology to enhance students' learning from their own perspective is often uncertain. This research has shown the students' perceived merits and limitations of diverse technologies (asynchronous online discussion, wiki, synchronous online discussion) in context of each. However, the interpretation of the students' perceptions in this research needs some consideration of their backgrounds, in that (with the exception of case study 3) they may represent, in relation to ICT, a more knowledgeable and interested group than the average higher education student. It is interesting to note that the students in case 3 felt least prepared for the new technology and also least positive about its merits in supporting their collaborative activity; they reverted to more familiar tools and sometimes elected the most knowledgeable students in IT as the ones who should upload the whole group's work.

Fourth, much more research has been conducted on the way in which students interact in group discussion using CMC (mainly asynchronous mode) than on collaborative project groups using computer tools. It appears that in CSCL research students' collaborative group processes in group project tasks are rarely reported. In case study 4, there is a more detailed description of the collaboration process. This provides insights into the way that students collaborate, what problems they encounter and how they try to solve some of the problems.

Fifth, this research suggested design principles to create conditions in which effective group interactions could be expected to occur. However, the suggested conditions should not be viewed as prescriptive guidelines for instructional design. Instead, they should be recognized as a general insight on the part of the researcher, based on the experience of interacting with the four cases. Findings based on these cross-case analyses are context-specific. They can be used for case-to-case applications of instructional design as well as for generating hypotheses for future research.

Last, the research sites where the four case studies were conducted were different in learning culture, students' cultural background, mode of institution (campus-based vs. specialized online distance graduate) and other local contexts. The commonalities drawn from the four cases may have more validity than if they had been drawn from a single institution or single national context. In addition, diverse sources of data were collected and used for triangulation: students' perceptions vs. tutor's perceptions, students' behaviours in a collaborative group task vs. students' perceptions, students' own voices vs. students' perceptions from closed questions. This use of diverse data sources and triangulation made it possible to see the issues from a more validated and wider

perspective.

However, this research has a few limitations.

First, the findings and conclusions of this study may be limited when it comes to generalizing in different learning settings where the enrolled students have different backgrounds. Therefore, the findings should be read with caution, bearing in mind the characteristics of the enrolled students. For example, in case study 1 (asynchronous online discussion in the UK), if the enrolled students' learning culture and individual students' language proficiency had been different, the result might have been influenced. There was a limitation in explaining the causes of different participation levels from national sub-groups due to lack of knowledge about their learning culture and detailed data on international students' English proficiency (in speaking, writing, listening and reading). More systematic data collection and analysis of the characteristics of their learning culture, the language used in the students' home country and individual students' English proficiency are needed for a further interpretation of the different levels of participation.

Second, the reported learning merits of CSCL were drawn from the enrolled students' perceptions. Therefore, further research to analyze their writing skills and critical thinking skills, as reflected in the discussion transcripts, is needed to see whether the learning merits which the students acknowledged, such as critical thinking skills or writing skills, have actually improved.

Last, the most challenging task for project groups was negotiating and resolving members' different opinions. However, in case 3, the data on students' collaborative interaction patterns were mainly collected from the answers to the open and closed questions in the

questionnaire, which were insufficient. So, the comparison of this aspect in the two cases (cases 3 and 4) was limited. The tutor's intervention strategies were also not explored, due to a lack of detailed data. To date, the tutors' roles in collaborative group working have rarely been studied. In collaborative learning environments, the tutor's facilitation or intervention skills require subtle use, because students have more control over their collaboration process. Seemingly, lacking the tutor's facilitation in the students' collaboration process in the four cases might reflect the difficulty of intervention.

Although collaborative learning requires students' taking a more active role in their learning process, the tutor's preparation and skilled monitoring and intervention strategies are still needed, in particular, when students' collaboration is not effective. However, in general, tutors are employed on the basis of their expertise in a subject domain rather than their teaching skills. Moreover, the tutors involved in the research were in an education-related subject and they therefore may be expected to be more knowledgeable about instructional methods than other tutors in other subject areas. This may underestimate the need for tutor training in facilitating skills for effective collaborative learning. Therefore, further research is needed on the tutor's role in order to provide practical recommendations based on empirical research findings.

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<Appendix 1> The contexts of four cases

<i>contexts</i>	<i>Case1</i>	<i>Case2</i>	<i>Case3</i>	<i>Case 4</i>
<i>Research site</i>	UK, traditional campus-based university	South Korea, a special graduate school for distance learning	UK (same with case 1)	South Korea (same with case 3)
<i>Program</i>	Med in ICT	Master in Educational Technology	Post Graduate Certificate in Education (PGCE)	Master for Teacher Education
<i>Module name</i>	Learning and ICT	Introduction to e-learning	Does the use of ICT enhance geography teaching?	Cyberspace and adolescent
<i>Delivery mode</i>	Traditional on-campus course blended online activities between classes	Online distance course blended 2 off-line sessions	Traditional on-campus course incorporated Wiki	Online distance course blended with 3 off-line sessions
<i>Task</i>	Asynchronous online discussion based on set reading	Weekly asynchronous online discussion about course content	Group design project : planning and delivering geography lesson using ICT	Group research project : Group research and presentation, open-task (group select task topic and way of group working)
<i>Task guideline</i>	'Netiquettes' provided, two message posting per	Strict discussion period: Tuesday- Monday No required message	Topic was given by the field school tutor	Open task: group selected research topic related to the module content

	discussion,	posting		
<i>Duration of the task</i>	6 online discussions	13 online discussions forums	3 weeks	One semester (15weeks)
<i>Assessment or relation with assignment</i>	No assessment	Assessment for grading: online discussion participation is counted for Online participation rate (20%), and the posted messages can be used for another assignment; portfolio (30%)	No assessment, peer-reivew	Assessed for grading: total 60%: group project product (40%), online discussion participation(20%)
<i>Group size</i>	12 students	20 students	35students, 6 groups (5-6 members)	8 students, 2 groups (4 members)
<i>Group composition principle</i>	One class	One class	Tutor assigned groups by the proximity of field school to the students' current residence	Tutor assigned groups; one group-similar study subject students The other group: the remainders (mixed study subject area)
<i>Tutor's role</i>	Module tutor: posting the discussion topic and wrapping the discussion Online discussion	Posting the discussion topic, no participation in the discussion process, final assignment feedback	Placement school mentor supported students' working process	Module tutor : feedback and advice in face-to- face class sessions, online teaching assistant

	facilitator: facilitate discussion			supported students using sms
<i>Tutor's characteristics</i>	PhD in the UK, experienced in e-learning,	PhD in USA, so, might be influenced by South Korean and USA educational culture, experienced in elearning	First use of Wiki	Same in case 2
<i>Students' characteristics</i>	multi-national backgrounds : British(3), Cypriot(4), Taiwan (2), Indonesian(1), Korean(1), Turkey (1) mixed with mature UK part-time students and younger international full-time students	All South Korean students Mostly mature adult learners	All UK students	All South Korean students, mature students
<i>Previous experience</i>	Online discussion experience : yes 9, no 3	Previous online discussion experience : yes 5, no 13	Familiarity with collaborative learning: yes 27, no 2. 20 students: unfamiliar with web-editing	Previous group project experience : yes 7, no answer 1 Previous online discussion experience : yes 7, no 1

<i>Used technology</i>	Asynchronous online discussion tool embedded in WebCT	Asynchronous online discussion tool embedded in 4cSoft(Korean product)	EcoWiki	Synchronous online discussion tool: self-select online chat tool, such as msn...
<i>Institutional characteristics</i>	Traditional campus based university, high rate of international student enrollment, WebCT was chosen centrally	The Postgraduate School for Distance is one of the first virtual postgraduate schools in South Korea, highly innovative and supportive in adopting e-learning	Same with case 1	Same with case 2

<Appendix 2> Ethics form in case 1

<Appendix 3> Informed consent forms

<3-1> Informed consent form in case 1

Informed consent form

Hello,

My name is Byeong-Hyun Lee. I am a doctoral candidate student and also a teaching assistant for this module. My major research interest is how to design and manage online discussion to support learning. For my thesis, I will focus on students' participation in online discussion and what factors influence the successful implementation of online discussion.

I am writing to ask you if you would be willing to participate in this research. The research will be undertaken alongside 'Learning and ICT' in spring term 2007 and will involve online discussion, questionnaires and interviews. However, you are free to choose to participate in this research and have the right to withdraw from this research at anytime without any disadvantage. Participation in the discussion is not conditional on participation in the research or vice versa.

Confidentiality of all students will be maintained. For participating students, all personal names will be substituted with pseudonyms and any personal information will be edited and kept securely to safeguard your privacy before collecting or disclosing any information in messages. Students' names will not be used at any time during or after the research. If you wish you will also have a chance to look over any messages I would like to use in my report before I complete my work. For those declining to participate in the research no messages will be collected or stored (other than within the password controlled WebCT environment for teaching purposes) nor will any messages be disclosed in any reports. You may choose to take part in questionnaires and interviews separately from giving permission to report discussions. If you choose to withdraw at a later date any data pertaining to you will be deleted from all stored records and not used in reports.

Please email me at anytime [REDACTED], if you have any questions or concerns about the research or if you want to withdraw at any time.

Thank you.

I have read and understand this consent form, and I volunteer to participate in the MEd IT online discussion research. Please tick the following.

Questionnaire / interview

()

Discussion Board Messages

EITHER

- I am happy for you to report discussion board messages of mine anonymously and I have the option to see the messages first

()

OR

- I do not want you to include any messages of mine in your report even if they are reported anonymously and I have the option to see the messages first

()

Participant Name :

Signature :

Date:

I want to receive a copy of the final report

()

<3-2> Informed consent form in case 2

연구참가 동의서

안녕하세요?

저는 숙명여자대학교 원격대학원에서 원격교육공학을 공부하고, 현재 영국 Birmingham 대학에서 이러닝 전공으로 박사과정 중에 있는 이 병현 입니다.

저의 연구주제는 학습을 지원하기 위한 온라인 토론을 어떻게 디자인하고 운영하여야 하는가 입니다. 이 연구를 위해 저는 한국과 영국에서 온라인 토론을 운영하는 2개의 코스를 사례 연구하여 학생들의 온라인 토론 참여형태, 학생들의 온라인 토론에 대한 인식, 그리고 각각의 사례에서 어떤 상황적 요인들이 온라인 토론의 성공 또는 장애요인으로 작용하는지 그리고 한국과 영국의 사례분석의 결과 사회문화적 배경요인으로 인해 어떠한 차이점 또는 공통점이 있는지를 분석합니다.

본 연구는 2007년 1학기 ‘이러닝의 이해’ 과목 수강학생들을 대상으로 온라인 토론관찰과 설문지를 통해 진행될 것입니다. 이 연구과정에서의 참여는 여러분의 자유의사에 달려있고, 언제든지 연구참여를 철회할 수 있으며, 연구과정에서의 참여나 불참여로 인해 어떠한 불이익도 받지 않을 것입니다. 수집된 자료는 오로지 연구목적으로만 사용되고, 개인의 익명성은 철저히 보장될 것입니다.

여러분의 연구협조는 제 논문을 완성하는데 귀중한 자료로 사용될 뿐만 아니라, 향후 온라인 토론 개선을 위한 자료로도 활용될 것입니다.

이 연구에 대한 문의사항이 있으시면 언제든지 [redacted] 또는 [redacted] 로 연락해 주시기 바랍니다.

감사합니다.

본인은 이 연구의 취지를 이해하고 연구과정에 참여하는데 동의합니다.()

성명 :

날짜 : 2007년 3월 6일

<3-3> Informed consent form in case 3

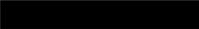
Dear Student:

The School of Education, together with The Center for Educational Technology and Distance Learning (CETADL), is currently conducting a project called EcoWiki: Evaluating Collaborative and Constructive Learning with Wikis. For this project, we are trialing a system called FlexWiki, for which your participation is kindly requested.

The trial will run throughout the Autumn term. Evaluation activity will be scheduled as part of your class to help us understand your experiences with this system. Your participation is important to us because it will help us to assess FlexWiki's effectiveness for collaborative learning and to develop it further in the future. While the use of FlexWiki will be required to complete your assignment, completing the questionnaire, the evaluation sheet and participating in feedback discussion will be completely voluntary.

Please see the reverse side of this sheet for more information about the trial. Feel free to contact me at your earliest convenience if you have any questions or concerns.

Yours sincerely


CETADL Research Associate
University of Birmingham




<3-4> Informed consent form in case 4

연구참가 동의서

안녕하세요?

저는 숙명여자대학교 원격대학원에서 원격교육공학을 공부하고, 현재 영국 Birmingham 대학에서 이러닝 전공으로 박사과정 중에 있는 이 병현 입니다.

저의 연구주제는 한국과 영국에서 컴퓨터 지원 그룹 프로젝트를 운영하는 2개의 코스를 사례 연구하여 학생들의 그룹 프로젝트에의 참여과정과 온라인 토론매체의 활용방식, 그룹 프로젝트에 대한 인식, 그리고 각각의 사례에서 어떤 상황적 요인들이 그룹프로젝트의 성공 또는 장애요인으로 작용하는지 그리고 한국과 영국의 사례분석의 결과 사회문화적 배경차이로 인해 학생들의 참여형태나 인식에 있어 어떠한 차이점 또는 공통점이 있는지를 분석합니다.

본 연구는 2007년 1학기 ‘청소년과 사이버문화’ 과목 수강학생들을 대상으로 온라인 토론관찰과 설문지를 통해 진행될 것입니다. 이 연구과정에서의 참여는 여러분의 자유의사에 달려있고, 언제든지 연구참여를 철회할 수 있으며, 연구과정에서의 참여나 불참여로 인해 어떠한 불이익도 받지 않을 것입니다. 수집된 자료는 오로지 연구목적으로만 사용되고, 개인의 익명성은 철저히 보장될 것입니다.

여러분의 연구협조는 제 논문을 완성하는데 귀중한 자료로 사용될 뿐만 아니라, 향후 온라인 그룹 프로젝트 개선을 위한 자료로도 활용될 것입니다. 이 연구에 대한 문의사항이 있으시면 언제든지 [redacted] 또는 [redacted] 로 연락해 주시기 바랍니다.

감사합니다.

본인은 이 연구의 취지를 이해하고 연구과정에 참여하는데 동의합니다.()

성명 :

날짜 :

<Appendix 4 > Questionnaires

<4-1> Questionnaires in case 1

* Please answer the questions by putting a tick in the box or by writing your answer.

Section 1. Background information

<p>1. My course :</p> <p>2. My student status : <input type="checkbox"/> Full time <input type="checkbox"/> Part time</p> <p>3. My gender : <input type="checkbox"/> Male <input type="checkbox"/> Female</p> <p>4. My nationality :</p> <p>5. English is my : <input type="checkbox"/> First language <input type="checkbox"/> Second language</p> <p>6. My age</p> <p><input type="checkbox"/> 21 – 26 <input type="checkbox"/> 27 – 32 <input type="checkbox"/> 33 – 38 <input type="checkbox"/> 39 – 44 <input type="checkbox"/> Older than 44</p> <p>7. Do you have any previous experiences of asynchronous/ synchronous online discussion?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>8. How many times did you post messages per discussion topic? (on average)</p> <p><input type="checkbox"/> More than 3 <input type="checkbox"/> 2 messages <input type="checkbox"/> 1 message <input type="checkbox"/> None</p> <p>9. How long did it take you to write a message? (roughly)</p>

Section 2. General perceptions of your learning style

	Strongly agree	Agree	Disagree	Strongly disagree
I learn more from sharing ideas with others than on my own				
I think I am better at writing than speaking				

I am familiar with group discussion through my education				
Learning discussion skills is important to me				

Section 3. Your perceptions and behaviours in online discussion process

	Strongly agree	Agree	Disagree	Strongly disagree
I felt comfortable in expressing my ideas in online discussion				
I read all the messages				
I made more effort to write my own message than to read other's messages				
Sharing ideas and knowledge with peers motivated me to participate				
I participated in online discussion because it was required				
I prefer more interaction with peers than tutors in online discussion				
I prefer the tutors to take active role in online discussion				
Lack of prompt feedback disappointed me				
I hesitated to challenge or to be critical of peer's opinion in online discussion.				
Sometimes I gave up posting messages because peers posted similar contents				
I hesitated to post because peers would evaluate my message content				
Participation in online discussion should be voluntary rather than compulsory				
I felt online discussion is time consuming and ineffective				

Section 4. Merits and barriers of asynchronous online discussion

	Strongly agree	Agree	Disagree	Strongly disagree
Online discussion motivated me to learn more about course contents				
Writing messages helped me to develop my critical thinking				
Reading other's messages helped me to develop my critical thinking				
Participation in online discussion improved my writing skills				
Online discussion enhanced my IT skills				
Online discussion promoted a sense of community with peer students				
I prefer studying course materials to participating in online discussion				
Lack of time hindered my participation in online discussion				
Lack of writing skills hindered my participation in online discussion				
Lack of knowledge of discussion topic hindered my participation				
I had some technical problems to access online seminar tools				
The online discussion software's interface and function are easy to use				

Section 5. Comparison of online discussion with face-to-face discussion

	Strongly agree	Agree	Disagree	Strongly disagree
I felt more comfortable with face-to-face discussion than online discussion				

Asynchronous online discussion encouraged deeper thoughts than in face-to-face discussion				
I participated more actively in face-to-face discussion than in online discussion in this module				
Flexibility of online discussion (anytime) motivated me to participate more than in face-to-face discussion				

Section 6. Your evaluation of online discussion

	Strongly agree	Agree	Disagree	Strongly disagree
I enjoyed online discussion				
Online discussion was helpful to my learning				
I was happy with the quality of our online discussion				
Everyone participated actively in online discussion				
The integration of online discussion with face-to-face class session enhanced the quality of learning compared to the classroom session alone				

Other Comments

<p>Some suggestions for improving online discussion</p> <p>What are the advantages or limitations in using asynchronous online discussion for you personally?</p>

<Thank you>

<Appendix 4-2> Questionnaires in case 2

1. 다음은 귀하의 학습스타일에 대한 인식을 알아보는 질문입니다.

	매우 그렇다	그렇다	그렇지 않다	매우 그렇지 않다
나는 혼자 학습하는 것보다는 다른 사람과의 협동학습이나 토론을 통해 더 잘 배운다				
나는 말보다는 글로 내 생각을 표현하는데 더 능숙하다				
나는 이전 교육경험을 통해 그룹 토론에 익숙하다				
토론 기술을 익히는 것은 나에게 중요하다				

2. 다음은 (비실시간) 온라인 토론과정에서의 여러분의 인식과 행동에 관한 사항을 알아보는 질문입니다.

	매우 그렇다	그렇다	그렇지 않다	매우 그렇지 않다
나는 온라인 토론에서 나의 의견을 표현하는 것에 편안함을 느꼈다				
나는 토론 게시판의 모든 메시지를 읽었다				
나는 다른 사람의 메시지를 읽는 것 보다 나 자신의 메시지를 작성하는데 더 많은 노력을 기울였다				
나는 동료학생들과 지식과 의견을 교환하는 즐거움 때문에 온라인 토론에 참여했다				
나는 온라인 토론 참여가 평가되기 때문에 토론에 참여했다				
나는 온라인 토론에서 교수자 보다는 동료 학생들과의 의견교환을 더 선호한다				
나는 온라인 토론에 교수자가 적극적으로 참여하는 것을 원한다				
나의 메시지에 즉각적인 피드백이 없어서 실망한 적이 있다				

나는 동료학생들이 나의 글 내용을 평가하리라는 부담에 글 올리기를 주저한 적이 있다				
나는 동료학생이 나의 생각과 비슷한 내용의 글을 올려서 글 올리기를 포기한 적이 있다				
나는 온라인 토론에서 다른 사람 의견에 비판적이거나 반대의사를 표현하는 것이 어려웠다				
온라인 토론 참여는 의무적이기 보다는 자발적이어야 한다고 생각한다				
나는 온라인 토론이 시간 소모적이고 비효율적이라고 생각한다				

3. 다음은 (비실시간) 온라인 토론의 장단점에 관한 여러분의 인식에 관한 질문입니다.

	매우 그렇다	그렇다	그렇지 않다	매우 그렇지 않다
온라인 토론은 나의 학습에 큰 도움이 되었다				
메시지를 작성하는 과정이 비판적이고 고차원적 사고력 향상에 도움이 되었다				
다른 사람의 메시지를 읽음으로써 비판적 사고력 향상에 도움이 되었다				
온라인 토론 참여를 통해 나의 글쓰기 능력이 향상되었다고 생각한다				
온라인 토론이 나의 IT 활용기술을 향상시켰다				
온라인 토론은 동료학생들과의 공동체감을 증진시켰다				
나는 온라인 토론에 참여하기 보다는 학습 내용을 혼자 공부하는 것을 더 선호한다				
나는 시간부족 때문에 온라인 토론에 참여하는데 애로가 있었다				
글쓰는 능력부족 때문에 온라인 토론에 참여하는데 애로가 있었다				

토론 주제에 대한 지식부족 때문에 온라인 토론에 참여하는데 어려움이 있었다				
기술적 장애 (접속 문제) 때문에 온라인 토론에 참여하는데 애로가 있었다				
온라인 토론 소프트웨어의 인터페이스와 기능은 사용이 편리했다				

4. 다음은 면대면 토론과 (비실시간) 온라인 토론의 비교에 대한 질문입니다

	매우 그렇다	그렇다	그렇지 않다	매우 그렇지 않다
나는 온라인 토론보다 면대면 토론이 더 편안하다				
비실시간 온라인 토론은 면대면 토론보다 더 깊은 사고력을 촉진한다				
나는 온라인 토론보다 면대면 토론에 더 적극적으로 참여했다				
언제 어디서나 참여할 수 있는 온라인 토론의 융통성 때문에 나는 면대면 토론보다 더 적극적으로 참여할 수 있었다				

5. 다음은 온라인 토론에 대한 평가입니다

	매우 그렇다	그렇다	그렇지 않다	매우 그렇지 않다
온라인 토론은 즐거웠다				
나는 온라인 토론의 질적 수준에 만족한다				
모두들 온라인 토론에 적극 참여했다				
나는 온라인 토론이 이 강좌의 질적 수준을 향상시켰다고 생각한다				
온라인 토론이 활발할 때 학습동기가 높아지는 효과가 있었다				

<Appendix 4-3> Pre-questionnaires in case3

Microsoft Research Project Evaluation Questionnaire

ECOWiki - Evaluating Collaborative and Constructive Learning with Wikis

Section 1. About You

Name / Contact Details (leave this section blank if you wish to be anonymous)

Name: Tel: E-mail:

Your age – please tick the box that applies to you

18 – 23

24 – 28

29 – 33

34 – 38

39 – 43

44 or older
- please write age

Your qualifications

Please list any relevant qualifications you already have e.g. teacher training, degree:

Your familiarity with IT

Please tick if you have used any of the following indicating if you use it rarely (once a year), sometimes (once every one or two months), regularly (once or twice a week) or every day.

	Rarely	Sometimes	Regularly	Every day
E-mail e.g. Outlook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Word processor e.g. Microsoft word	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PowerPoint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spreadsheet e.g. Excel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Statistical package e.g. SPSS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Web browser e.g. Internet explorer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Web search engine e.g. google	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bibliographic reference tool e.g. EndNote	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Database e.g. Access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Web editing e.g. FrontPage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other IT You Use

Please list here any other IT hardware or software you use on a regular basis and not included in the list above:

Your experience of Collaborative Working

For these questions tick the box that best describes how you feel from strongly agree to strongly disagree.

	Strongly agree	Agree	Disagree	Strongly disagree
I am familiar with collaborative team working from my job				
I am familiar with learning collaboratively in groups through my education				
I enjoy working collaboratively in groups				
Collaborative projects should be assessed as a whole - with one grade for all the individuals				
Collaborative projects should be assessed with separate grades for each individual				
Collaborative project grades should have different components e.g. project outcome, team-work and individual effort				
Collaborative projects are usually fun and successful				
I learn more from collaborative projects than on my own				
Collaborative learning is working together at every stage of the process				
Collaborative learning is each individual working on part of the problem				
When collaborative projects fail it is because some individuals don't work as hard as others				
When a collaborative project fails it is because I haven't taken responsibility for my portion				

When collaborative projects fail it is because groups don't meet up or talk enough				
When collaborative projects fail it is because they lack leadership				
Learning collaborative working skills is important to me				

Other Comments

Please add anything else you would like to share about your experience of learning in groups:

Section 2. Planning and teaching lessons using ICT

Your expectations for this module – what do you hope to learn or how do you hope to benefit?

What will your lesson be about?

Title/topic of your proposed lesson:

Aims – what are the aims and objectives for the lesson?

Audience – who is this lesson designed for?

How do you plan to use ICT in your lesson?

Your role within the group

Will you be planning and delivering your lessons as a large group, in small groups or individually? Why have you chosen to work this way? What will your individual contributions be?

How will you be using FlexWiki to help you plan and deliver your lesson?

Thank you for filling in this evaluation questionnaire. Please return to your tutor or post to [REDACTED] at School of Education, The University of Birmingham, Edgbaston, Birmingham, B15 2TT. You can e-mail answers to [REDACTED]

<Appendix 4-4 > post-questionnaires in case 3

ECOWiki – Evaluating Collaborative and Constructive Learning with Wikis

Contact Details

We would like to be able to contact you one more time after you have completed your individual teaching, as sometimes how you feel about a course continues to change after it has ended. If you are happy for us to contact you again please give us a contact email address or phone number.

Name:
Tel:
E-mail:

Section 1. Your experience of Collaborative Working

For these questions tick the box that best describes how you feel from strongly agree to strongly disagree.

	Strongly agree	Agree	Disagree	Strongly disagree
I have learned some ways of working collaboratively on this course				
Collaborative learning is working together at every stage of the process				
Collaborative learning is each individual working on part of the problem				
I enjoyed working collaboratively on this course				
I learned more from collaborative work than on my own				
I feel our collaborative work was successful				
I was happy with my role in the collaborative work				

The project made me think about how to work as a team				
I was happy with the way our team worked together				
Collaborative projects should be assessed as a whole - with one grade for all the individuals				
Collaborative projects should be assessed with separate grades for each individual				
Collaborative project grades should have different components e.g. project outcome, team-work and individual effort				
When collaborative projects fail it is because some individuals don't work as hard as others				
When a collaborative project fails it is because I haven't taken responsibility for my portion				
When collaborative projects fail it is because groups don't meet up or talk enough				
When collaborative projects fail it is because they lack leadership				

Section 2. Your experience of FlexWiki as a collaborative tool

Which statement that best describes your experience with using FlexWiki for this module?

- Using FlexWiki helped me to collaborate
- Using FlexWiki hindered me to collaborate
- Using FlexWiki neither helped me nor hindered me to collaborate
- I did not use FlexWiki to collaborate

For these questions tick the box that best describes how you feel from strongly agree to strongly disagree.

	Strongly agree	Agree	Disagree	Strongly disagree
FlexWiki supports collaborative working				
It takes a long time to learn FlexWiki's commands				
FlexWiki's capabilities were sufficient for this course				
I would recommend FlexWiki to other students				
FlexWiki limits my ability to be creative				
I would be willing to use FlexWiki again in the future				

Did you experience any technical problems or limitations in your use of FlexWiki?

No

Yes (please specify)

Are there any particular features you would like to see implemented in FlexWiki?

With FlexWiki, we can record and review the history of how each page was created. Do you feel that your tutor should use this (please tick all that apply):

- For regular monitoring
- For determining who contributed what for assessment purposes
- Only when there is a dispute or appeal

Would you want to use FlexWiki again?

- Yes
- No
- Undecided

Section 3. Planning and teaching lessons using ICT

What do you think you have personally learned from working in groups on this module?

How successful was your lesson planning and delivery?

Collaboration

What did you each contribute to the group work?

How fairly was the work distributed?

How well did you work together as a team to meet deadlines?

How was the tutor's role?

Additional Comments

Please use this space for any additional comments.

<Appendix 4-5 > Questionnaires in case 4

1. 귀하는 이전에 학교나 직장생활을 통해 협동학습이나 그룹 프로젝트 수행 경험이 있습니까?

예 아니요

1-2. (위 질문에 ‘예’ 라고 응답하신 분만 답변하세요), 이전 협동학습이나 그룹 프로젝트 경험에 대한 귀하의 생각은 어떻습니까?

매우 긍정적이다 긍정적이다 부정적이다 매우 부정적이다

2. 귀하는 이 수업이전에 온라인 채팅이나 온라인 토론에 참여하신 경험이 있습니까?

예 아니요

3. 다음은 귀하의 학습스타일에 대한 인식을 알아보는 질문입니다.

	매우 그렇다	그렇다	그렇지 않다	매우 그렇지 않다
나는 혼자 학습하는 것 보다 다른 사람과의 협동학습을 통해 더 잘 배운다				
나는 이전의 교육경험을 통해 협동학습에 익숙하다				
협동하는 기술을 배우는 것은 나에게 중요하다 고 생각한다				

4. 다음은 이번 그룹 프로젝트에 관한 여러분의 인식을 알아보는 질문입니다.

	매우 그렇다	그렇다	그렇지 않다	매우 그렇지 않다
나는 학기초에 그룹 프로젝트 과제에 거부감을 느꼈다				
이번 그룹프로젝트는 즐거운 경험이었다				

나는 우리 그룹프로젝트가 성공적이었다고 생각한다				
나는 그룹 프로젝트를 통해 팀원으로서의 협동방식에 대해 배웠다				
나는 이번 그룹 프로젝트를 수행하면서 혼자 학습할 때 보다 더 많은 걸 배웠다				
그룹 프로젝트 과제를 통해 팀원들과 더 친근한 관계가 형성되었다				
나는 우리 그룹 프로젝트 최종 산출물에 만족한다				
나는 우리 팀의 그룹 프로젝트 수행 방식에 만족한다				
나는 그룹프로젝트 수행과정에서의 나의 역할에 만족한다				
나는 팀원 모두가 과제 완성을 위해 공평하게 기여했다고 생각한다				
우리 그룹은 비교적 초반부터 팀원간에 역할을 명확히 배분했다				
우리 그룹은 프로젝트 전체 과정을 함께 토론해 가면서 추진했다				
우리 팀은 프로젝트 추진 과정에서 잘 협동했다				
팀원들은 모임에 참석할 때 각자 맡은 역할을 잘 준비해왔다				
팀원 모두 모임에 잘 참석했다				
나는 팀 모임에 참석하는 시간을 확보하는데 애로를 겪었다				
나는 나에게 주어진 역할을 완수하기 위해 열심히 노력했다				
우리 팀원들은 서로의 의견에 대해 건설한 코멘트를 했다				
팀모임은 쟁점이 쉽게 해결되지 않고 팀원간의 의견조정에 어려움을 겪었다				
그룹 프로젝트가 실패하는 이유는 어떤 개인이 다른 팀원만큼 열심히 하지 않았기 때문이다				

그룹 프로젝트가 실패하는 이유는 팀원들이 자주 만나서 토론과 의견교환을 충분히 하지 않았기 때문이다				
그룹 프로젝트가 실패하는 이유는 리더십의 문제 때문이다				
나는 그룹 프로젝트가 시간 소모적이고 비능률적이라고 생각한다				
이번 프로젝트 과제를 혼자서 수행했다면 더 잘 했을 것이다				
온라인 토론은 그룹 프로젝트를 수행하는데 도움이 되었다				
나는 온라인 토론에서 나의 의견을 표현하는 것에 편안함을 느꼈다				
그룹 프로젝트를 수행하기 위해서는 온라인 토론 외에도 면대면 토론, 이메일, 전화 등 다양한 매체를 통한 커뮤니케이션이 보완되어야 한다				

5. 다음은 그룹 프로젝트 평가방식에 관한 질문입니다.

	매우 그렇다	그렇다	그렇지 않다	매우 그렇지 않다
그룹프로젝트 과제는 팀원 전체가 하나의 동일한 점수를 받아야 한다				
그룹프로젝트 과제는 각 개인이 기여한 정도에 따라 각자 다른 점수를 받아야 한다				
그룹 프로젝트 과제는 팀으로서 얼마나 잘 협동했는가를 평가해야 한다				
나는 그룹 프로젝트 과제는 여러가지 요소(최종 결과물의 수준, 개인의 기여도, 팀웍 정도)를 고려해야 한다				
그룹 프로젝트는 교수자에 의해서만 평가되어야 한다				
그룹 프로젝트는 팀원에 의한 평가가 포함되어야 한다				

6. 다음 질문에 대해 귀하의 경험을 토대로 자유롭게 기술해 주십시오.

○ 귀하가 보시기에 그룹 프로젝트의 교육적 장점 또는 단점은 무엇이라고 보십니까?

○ 그룹 프로젝트가 성공적으로 추진되기 위해서 가장 중요한 요인은 무엇이라고 보십니까?

○ 그룹 프로젝트를 추진하는데 있어서 가장 큰 어려움은 무엇이었다고 보십니까?

○ 향후 그룹 프로젝트 과제를 개선한다면, 어떤 제안을 하시겠습니까?
(과제 성격, 그룹 구성원수, 그룹 구성원칙 등)

※ 다음은 조사결과를 해석하는데 도움이 될 귀하의 개인적 사항에 관한 질문입니다.

1. 성별 : 남 여

2. 연령

21 - 26 27 - 32 33 - 38 39 - 44 45세 이상

3. 직업 :

<답변해 주셔서 감사합니다>

<Appendix 5> Tutor interview schedules

<Appendix 5-1> Tutor interview schedule in case 1

1. Why did you blend your course with e-learning component?
- 1-2. What percentage of modules (or tutors) adopt or use Web-CT (or e-learning component) in this university? Are there any incentives or pressures to adopt e-learning component in this university?
2. Why did you adopt asynchronous online discussion in this module? Or what was your purpose for adopting online discussion in this module?
3. How do you evaluate the online discussion? Do you think it met your intended purpose for adopting online discussion? From the tutor's perspective, what aspect was satisfactory and/ or not satisfactory ? And, from the tutor's perspective, what do you think of the educational advantages or disadvantages of online discussion?(A lot of research just reported the educational merits from the students' perspective)
4. This module integrated online discussion with face-to-face session, so, I think there needed some division of function between online discussion and face-to-face discussion. How did you manage between the two mode discussions? And, do you think it was effective?
5. In the online discussion, you participated as a wrapper for each discussion. What do

you think of the tutor's ideal role in the online discussion?

6. Students' comments on the desired tutor's role showed that they expect the tutors to take more active role in online discussion. If you think, your participation was not enough, what were the barriers of your active participation?

<Appendix 5-2> Tutor interview schedule in case 2

1. Could you tell me the current state of e-learning adoption in this university?
2. What are the incentives for e-learning adoption for instructors? What are the difficulties for e-learning use for instructors?
3. The problems of e-learning use in South Korea
4. Why did you adopt asynchronous online discussion in this module? Or what was your purpose for adopting online discussion in this module?
5. How do you evaluate the online discussion? Do you think it met your intended purpose for adopting online discussion?
6. What do you think of the tutor's ideal role in the online discussion?
7. What do you think about the relation between assessment and student participation in online discussion?
8. What do you think about the causes of monologue type discussion?
9. Could you explain the characteristics of newly adopted LMS?

<Appendix 5-3> Tutor interview schedule: in case 3

1. What were your objectives when you chose to be part of this project?
2. To what extent do you feel that these objectives have been met?
3. Has this project given you any new insights into how students work together, or what they think about the process of collaboration?
4. Do you feel that there are any limitations in the way that you assess this module?
5. In general, do you feel that collaborative work should be assessed? Why or why not?
6. Did your views on the assessment of collaborative work change as you participated in this project?
7. What do you see as the main advantages and disadvantages of FlexWiki as a collaborative tool?
8. What do you think is necessary to make FlexWiki an effective collaborative tool for your students?
9. Effects of group size
10. Assessment

<Appendix 5-4 > Tutor interview schedule in case 4

1. Why did you adopt group project task in this module?
2. How do you evaluate the group project? Do you think it met your intended purpose for adopting group project?
3. What do you think of the tutor's ideal role in the group project?
4. What do you think the most difficult thing for students in implementing group project task?
5. What is the assessment criteria for the group project task? Why?
6. What do you think the enablers for successful group project and the barriers to group project?

<Appendix 6> Focus group topics

<Appendix 6-1 > Online focus group topics in case 1

1) Looking back at your own and others' contributions on this course or thinking perhaps of other examples you may have contributed to, what do you think makes the difference between an online discussion that works and one that does not work?

2) What are the barriers or limitations to this kind of online forum and in what ways does this type of discussion have an advantage over classroom discussion?

3) What do you think the tutor needs to do to help discussions work?

<Probing questions>

1) "I absolutely recognize how important the instructor's individual feedback is to motivate students' active participation. Is this an Asian student's perspective? Or western culture student also has same expectation? I am very curious to know."

2) "Do you think the assessment strategy can influence your participation or not?"

<Appendix 6-2> Online focus group discussion topics: case 2

- The influence of online discussion on your learning
- How did you prepare for online discussion participation
- What did you learn from online discussion
- The merits and limitations of online discussion
- Individual barriers for participating in online discussion
- Suggestions for the improvement of online discussion in the future

<Appendix 6-3> Group discussion topics: case 3

- What roles and responsibilities do you need to take to manage effective team working?
- What kinds of barriers to effective team working are there?
- Did you experience any of these in your team?
- Should there be a component of grade for how well the team works together?
- Who should grade the team (e.g. tutor, other members of the group)?
- How should the group resource be graded?
- What criteria would you want to include?
- Who should grade the resource?
- What proportion of grade should be for team working or the finished resource?
- Should the grade be for the whole group or the individual?
- What are the limitations of using Wiki for group collaboration?

<Plenary discussion topics>

- Team working Roles and responsibilities
- Barriers to teamworking
- Assessing team working
- Flexwiki

<Appendix 6-4> Group reflection diary topics in case 4

- The advantages and limitations of a group project
- What you learned personally from the group project
- The difficulties or barriers with group projects
- The most important enablers for successful group projects
- The merits and limitations of online discussion and face-to-face discussion for group project
- Any suggestions for improving group projects in the future

<Appendix 7> Students' perceptions in case 4

<i>Statement</i>	<i>Group</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>1) I enjoyed working collaboratively</i>	Group A		1	3	
	Group B	1	3		
<i>2) I feel our group project was successful</i>	Group A		2	2	
	Group B	1	3		
<i>3) I was happy with my group's end product</i>	Group A		1	3	
	Group B	2	2		
<i>4) I was happy with the way our team worked together</i>	Group A		1	3	
	Group B	1	3		
<i>5) Our group collaborated well in the group working process</i>	Group A		1	2	1
	Group B	1	3		

<i>Statement</i>	<i>Group</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>6) Issues were not resolved easily and we had difficulty in negotiating opinions</i>	Group A	1	2		1
	Group B			2	2
<i>7) Our group divided the work among members from an early stage</i>	Group A		2	2	
	Group B		4		
<i>8) Our group mostly worked on all parts of project together by discussing</i>	Group A		2	1	
	Group B	1	3		
<i>9) I made a serious effort to fulfill my team role</i>	Group A	1	3		
	Group B		2	2	
<i>10) I believe everyone in my team took their roles seriously and contributed fairly</i>	Group A	1	2		1
	Group B		2	2	

<i>Statement</i>	<i>Group</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>11) Online discussion was helpful to group project</i>	Group A	1	1	2	
	Group B	1	3		
<i>12) I felt comfortable to express my ideas in online discussion</i>	Group A			3	1
	Group B	1	3		
<i>13) To implement group project, various ways of communication (such as fact to face meeting, email, telephone) should be used, as well as online discussion</i>	Group A	1	2	1	
	Group B	2	2		
<i>14) I learned more from group project than on my own</i>	Group A		2	2	
	Group B	1	2	1	
<i>15) If I had done the project alone, I would have done better</i>	Group A	1		2	1
	Group B		1	2	1

<i>Statement</i>	<i>Group</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<i>16) I have learned some ways of working collaboratively as a team</i>	Group A	2	2		
	Group B	1	2	1	
<i>17) Through the group project, a more friendly relationship was formed among members</i>	Group A		2	2	
	Group B	2	1	1	
<i>18) Collaborative project grade should have different components-outcome, teamwork, individual effort</i>	Group A	2	2		
	Group B	1	3		
<i>19) Finished project should be assessed as a whole, with one grade for all the individuals</i>	Group A		2	2	
	Group B		1	3	
<i>20) Finished projects should have a separate grade for each individual's contribution</i>	Group A		1	3	
	Group B		3	1	