

Using Technology to Support Collaborative Learning through Assessment Design

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This thesis is dedicated to my wonderful mother Josephine, my dad Kevin, my beautiful big sister and my best friend Christine, and to my eldest brother Lawrence, the fisherman. You have left this world forever, having shared so much with me. I am grateful that you have shaped, and inspired my life in so many ways, you are always in my heart, mind, and in every waking moment of my life.

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List of Publications

Doolan, M. A., Thornton, H. A. & Hilliard, A. (2006) 'Collaborative Learning: Using technology for fostering those valued practices inherent in constructive environments in traditional education'. *Journal for the Enhancement of Learning and Teaching*. 3 (2) pp.7-17.

Doolan, M. A. (2006a) 'Effective Strategies for Building a Learning Community Online using Wiki'. In: *Proceedings of the 1st Annual Blended Learning Conference 2006*, 15 June. Hatfield, Hertfordshire: University of Hertfordshire pp.51-63.

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Doolan, M. A. (2007b) 'Our Learners are the Net Generation Growing up in a Digital World. How then do we Engage with and Support this Type of Learner?'. In: *Proceedings of the 6th European Conference on e-Learning*, 4-5 October. Copenhagen, Denmark: Copenhagen Business School pp.159-172.

Doolan, M. A. (2008) 'Bridging the Gap: Adapting curriculum design and teaching practice to engage the net generation learner in an online learning community'. In: *Proceedings of the 3rd Annual Blended Learning Conference 2008*, 18-19 June. Hatfield: University of Hertfordshire.

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Doolan, M. A. (2010) 'Developing A Web 2.0 Pedagogy To Engage The Net Generation Learner In A Community For Learning In Higher Education'. In: *The Fifth International Blended Learning Conference: "Developing Blended Learning Communities"*, 16-17 June. Hatfield, Hertfordshire: University of Hertfordshire.

Abstract

This thesis offers an assessment design for collaborative learning, utilisation of blended learning support through current communication technologies and highlights the crucial role of the tutor. The thesis designed and tested a theoretical framework which encompassed an active learning environment and resulted in the development of the shamrock conceptual framework.

To test the theoretical framework, clarify the role of the tutor and the impact on the learner experience two studies were undertaken using pedagogical models that combined the concepts of learner-centric, sociocultural and dialogic perspectives on collaborative learning and technology in meeting the needs of learners in the 21st Century.

In the first study, the role of the tutor was found to be crucial in setting, implementing and guiding learners using the assessment design as part of a social constructivist pedagogical practice. The pedagogical approach adopted was to blend face-to-face and Wiki learning experiences and was found to promote learner ownership, engagement and the fostering of a learning community.

The second study validated the first and provided additional asynchronous technology experiences in addition to the Wiki blend in the assessment design. Study 2 examined the role of the tutor and the learner whilst using

current technologies comprising podcasts and video and a Wiki in the collaborative experience.

Findings showed that the Wiki supported community and collaborative aspects of a sociocultural practice whilst learners were engaged in authentic learning activities and led to a well supported learning environment.

The importance of technology design and use to accommodate collaborative and community aspects was found to be an essential component. It was found that technology is not simply an add-on but rather needs to be planned and considered purposefully by both tutors and learners when used in a blend to supplement learning on campus as part of an assessment design in higher education. This study has shown that, for this to happen, academics need to be provided with the appropriate support, knowledge and skills required in developing a blended learning experience using a Wiki supplemented by class contact on campus as part of an assessment design.

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Chapter 1 Introduction

This thesis explores learner experiences of technology whilst collaboratively learning in groups to complete assessed learning activities on an undergraduate module in higher education. To this end, the thesis helps clarify the role of the tutor whilst using pedagogical models that combine the concepts of learner-centric, sociocultural and dialogic perspectives on collaborative learning and technology in meeting the needs of learners in the 21st Century. This chapter presents this in the context of changes currently taking place in higher education. This chapter also reports on the research background, the research problem, the research questions and the rationale for the research presented in this thesis. Additionally, the structure of the thesis is provided in this chapter.

1.1 The Higher Education sector

We live in truly exciting times in the midst of social and technological change in the Higher Education sector. As the Higher Education sector adapts to changes in its own environment, at the same time the definition of what a learner is and what his or her needs are is changing (Prensky, 2001; Oblinger, 2005; Cheese, 2008). These studies show the perceptions of learners are changing within their own social context, as they engage with technological innovation and discover new ways to incorporate these changes into their lives. Advances in technological development have resulted in the introduction of technical infrastructure including Managed

Learning Environments (MLEs) and Virtual Learning Environments (VLEs), now widely used in Higher Education. The design of these environments is developing and constantly evolving in the higher education sector to accommodate changes in the Higher Education landscape. However, educational practice has been slower to respond to the pace of change, creating a gap between the educator and the learner that in turn may be failing to meet the expectations of this new generation of learners.

1.2 The changing learner: technology use affecting practice in Higher Education

The term 'baby boomers' was coined by Jones (1980) and describes those born in the post-war years between 1946 and 1964 that constitute the largest part of the population to fall outside of the natural technological mind-set of the 'digital native'(Prensky, 2001). The digital native on the other hand has grown up with technology that is currently regarded as ubiquitous. Born since the very end of the 1980's, digital natives, generally speaking, find the use of technology such as computers, the Internet and mobile phones to be a far more natural experience. Coming from this background it has been stated, *"students today are all 'native speakers' of the digital language of computers, video games and the Internet"* (Prensky, 2001:1). Like digital native, the Net Generation (Oblinger, 2005), generation Y or the Millennial Generation (Cheese, 2008) are all terms for a demographic definition of people born between the mid 1970's and the early 2000's. An overview of the different

generational eras is shown in Table 1.1. The similarities between these are a generation familiar with the use of digital communications and technology. They see such devices as second nature as well as a natural extension of work and play. This generation see technology as an ‘enabler’, and are active information seekers with a need to undertake activities with immediacy, from anywhere, anyplace, and at any time. However, although familiar with technology, the true concept of a naturalised digital native falls into the generation now beginning to enter Higher Education, those born since the Internet became widely available, the 1991 to 2012 born ‘Generation Z’ (Mitchell, 2008). As learners, generation Z are connected and personally equipped with the latest technologies such as mobile phones, personal digital assistants, and wireless laptops and use these as a tool to support learning. *“They use the computer, the internet, and books simultaneously”* (Canole et al, 2006:6).

Names	Birth Period	Reference
Baby Boomers	1946 - 1959	Jones, 1980
Generation X Baby Busters	1960 - 1979	Coupland, 1991
Generation Y Millennial Net Generation	1975 - 2004	Cheese, 2008 Oblinger, 2005
Generation Z Digital Natives	1991 - 2012	Mitchell, 2008 Prensky, 2001

Table 1.1: Established Generational Eras

To contrast this, Digital Immigrants are *“those of us who were not born into the digital world but have, at some later point in our lives, become fascinated by and adopted many or most aspects of the new technology are, and always*

will be compared to them” (Prensky, 2001:2). Thus the digital immigrants like the baby boomers have witnessed the introduction of technologies such as the Internet. These have a far broader set of responses towards technology, from strong resistance to being as technologically immersive as a digital native, but they will always in some way retain their link to their own past in their engagement with technology. The digital immigrant and baby boomers can be seen as the opposite of the digital native, generation Y and the millennium generation.

1.3 The gap in technology use in Higher Education

When referring to technology Biggs (2003: xi) posits *“It has established a place in the normal delivery system of most universities, whether on or off campus”*. Given the availability of the technological infrastructure, Sharpe et al (2006) assert that educators should now be thinking about how to use technology to support learners, particularly as it is prevalent in the lives of undergraduates. Garrison and Anderson (2003) purport that those in Higher Education need to see the value technology brings to learning. They suggest it plays an increasingly important role in the educational experience. They go on to suggest it is a vital component within a Higher Education system.

It is quite clear, therefore, that technology is widely regarded as a component of the student experience and adds value to the educational experience; the technological infrastructure is in place in Higher Education and students are using it.

It is apparent, however, that there is a gap between how technology is used by the pre and post digital age generations. This is evident in the differences in actions and behaviours whilst using technologies. Digital learners frequently use electronic resources to support learning (Sharpe et al; 2005). For instance, it is not uncommon for the pre digital age generation to print a document for amendment. The opposite is true for the post digital age that edits the document using the technology (Prensky, 2001).

1.4 Assessment as the driver of learning

“Assessment is without doubt one of the major “drivers” of the teaching-learning process” (Race, 2006; 2010). Assessment for learning or formative assessment is purported by Wiliam (2007). This view is based on the premise that assessment informs learning whilst learning is in progress. According to Wiliam (2007) as learners actively engage in their own learning they assess themselves which helps them understand how to improve. Thus, when learners provide their own explanations, they are encouraged to think about what they know and their own misconceptions..

Given the noted importance of assessment and the significant role it plays in the teaching and learning process, assessment will guide what students learn and the way in which they do this. The assessment in this research was set to provide learners with an innovative way, best suited to the learning process and outcomes. With this in mind, research learners were directed to work collaboratively in groups of six to complete assessed

learning activities supported by technology whilst studying on an Information Systems Development module. The activities were designed to encourage active learning by doing (Race, 2001) and to support learners to actively practice and make sense of the course material administered during the course. This research focuses on supporting collaborative learning through assessment and therefore does not focus on assessment per se. However, it does provide an in-depth description of the assessment design when presenting the role of the tutor in the design and development of the online and offline learning environment in Chapter 3 and the impact of this role on the learners' experience in Chapter 6.

1.5 Situating the research

It is reported, *“Digital Immigrant teachers assume that learners are the same as they have always been, and that the same methods that worked for the teachers when they were students will work for their students now”* (Prensky, 2001:3). However, learners' behaviours, attitude and expectations of Higher Education are actually different according to Mandelson in his report (DBIS, 2009:70), where he states that there is a *“greater demand for flexible learning, as students from a more diverse set of backgrounds and stages of life aim to pursue Higher Education around work or other obligations”*. It is clear that technology is perceived as a way of providing such flexibility, as Mandelson goes on to say *“New technologies make possible new approaches to distance teaching and learning”*.

No matter what the platform is for learning, over the years, experience has taught me that learners and teachers are invariably responsible for learning. In my professional practice as a tutor I am responsible for supporting learners in curriculum design (Doolan, 2004; 2006; 2007a; 2007b; 2008; 2009; 2010a; 2010b). These studies show that as a tutor I explicitly build the learner in as an individual into my curriculum development by giving learners control over parts of their learning environment, at times through using technology. My experience has lead me to see the learning environment, whether online or offline, as one that is organic; growing and developing collectively with learners over time. Table 1.2 summarises this approach. Mindful that learners are not experts in theory and the practice of curriculum design and pedagogy, my emphasis is on learning collaboratively through reciprocal participation, providing flexibility for learners in terms of how, when and where learning occurs whilst nurturing teacher-student, student-student and student-teacher relationships.

	Acquisition	Participation
Goal	Individual enrichment	Community building
Learning	Acquiring facts Surface Approach	Participant Deep Approach
Student	Receiver	Peripheral participant
Tutor	Instructive, Expert	Social Constructive Dialogue partner
Knowledge	Possession 'Fountain of knowledge'	Aspect of practice 'Shared knowledge'
Knowing	Having, possessing	Belonging, participating

Table 1.2: Tutor relationship learner-centric adapted from (Coffield, 2008: 7)

I believe in a partnership approach and engagement in a dialogue between all parties in the practice of teaching and learning. I believe the tutor is not the fountain of knowledge, that knowledge is socially constructed (Vygotsky, 1978) and that the sharing of knowledge will only take place when the tutor and learner feel a sense of belonging to the learning environment (Doolan, 2007a; Wenger, 1998). It is my view that learning will only occur through the coming together of this active participation and engagement.

1.6 Research background

An in-house built, university wide Managed Learning Environment (MLE) was introduced at the university where the research was undertaken in 2001 in response to the changes in the Higher Education landscape. The potential of the MLE to set up and manage group working online was investigated and a comparison was made between the group based experiences online and face -to-face traditional group working (Doolan 2004; Doolan and Barker, 2005). These studies highlighted the need for a more organic technology; one that enabled learners and tutors alike to develop content rather than the MLE that was predominately used as “*shovel ware*” to post notes, news items, and learning materials. The discussion facilities did support out-of-class dialogue, however this was limited to ‘post and respond’; hence the move to the exploration of a Wiki, offering the ability to co-author and co-construct dynamic learning environments to support collaborative learning (Doolan, 2006; 2007a; 2007c; 2010a; 2010b). An outcome of this study was the development of strategies for the tutor in addressing, designing and

implementing an online learning community of undergraduate computing students through the use of Wiki technology. The argument was made that *“online activities should be considered in terms of overall student learning experience and blend, combining face to face sessions with online learning to maximise the pedagogic opportunities afforded by both approaches”* (Doolan, 2006:70).

This was found to be a key role for the tutor in ensuring student ownership, empowerment and engagement and in fostering a learning community. A natural progression from this work was the study of the effectiveness of the Wiki for creating a sense of community amongst ninety-six learners engaged in group-based assessed activities (Doolan, 2007a). Results showed that learners valued the experience of using a Wiki in fostering a learning community and highlighted that both people and task aspects of learning design are important when considering the design of a blended online and face-to-face group based experience. From those who were people-focused there was a concern expressed relating to the lack of visual cues from other learners:

“there is no visual audio feedback people may take things the wrong way” also a “lack of true response by facial expression” (Doolan, 2007a:81).

In response to these concerns in 2006 a multi-mode collaborative student learning environment was set up and implemented incorporating Wiki, Blogs, podcasts and video (Doolan, 2007b; 2008; 2009). This work forms a part of this study. The preceding works influenced the methodological

considerations and influenced my research stance, which shifted from a mixed quantitative and qualitative approach in year one of the study, in 2005-2006, to a qualitative case-study research strategy in the subsequent year. Previous works also highlighted the concept of theory building as a central tenet of this study. The methodological considerations are justified in Chapter 4. Additionally, published works (Appendix C) and this research study in this thesis highlight the importance in my practice of learners and tutor alike having the opportunity to co-develop content. Moreover, it is important in my practice to tap into the potential of learners as a 'valuable learning resource'. By this I mean, to support learners and educators to engage in the co-creation of learning resources such as audio, video, documents and presentations. In so doing, these can be used as a learning repository to share and receive feedback on assessment or works in progress whilst engaged in collaborative learning. From these a learning resource can be collectively created to revisit year on year (Doolan, 2006; 2007a; 2009; 2010a; 2010b).

It is intended that by gaining insight into the learner and tutor experience, this research will help in bridging the gap between learners' technological skills, their behaviours, expectations and that of their tutors. Insights will be gained by seeking answers to the research questions as presented in the next section.

1.7 The research questions

The aim of the research in this thesis is to help understand:

How can technology be used to support learners and teachers in collaborative learning through assessment?

To help meet the research aim, the original contribution to practice is based around the three key themes of this research: **tutor**, **technology** and **collaborative learning** hence the following sub questions:

1. *What is the learner experience of collaborative learning through technology?*
2. *What is the role of the tutor in technology-supported collaborative learning?*

Evidence of the impact on the learner experience is drawn from the learners' self-evaluation statements derived from their self-reflections captured in a Blog. These were used to evaluate the students' perception of their experience. Evidence is also drawn from contributions made by learners to the technology. The role of the tutor in the practice of the design and implementation of the blend of online and offline learning is documented in Chapter 3; observations and personal reflections of practice were captured daily and supported by the use of a journal as described in Chapter 5.

It is intended that outcomes of this research will support educators in developing appropriate skills and expertise in their use of technology to bring about transformation of ways of working, learning and interacting in learning and teaching. It is intended that the output of this doctoral research,

therefore, will help to support staff in building confidence to use and apply technology in innovative ways for collaborative learning.

1.8 Original contribution to practice

Through this thesis I will clarify the role and impact of the tutor in supporting student learning through the implementation of a learning 'blend' comprising a Wiki and a class based setting in addition to the university's MLE. Such clarification will firstly establish that there is a clear role for the tutor in establishing an online learning environment to 'blend' with an offline learning environment to support collaborative learning through assessment design. Secondly, this thesis will provide guidance on how this role can be enacted as this area of practice develops further. This will be achieved through a practical example of using a 'blend' comprising a Wiki in addition to the university's MLE in the learning design and adaptation to curriculum which is underpinned by social constructivism, community, and blended learning theories and the principles of 'good teaching and learning practice'. The argument is made that when technology is used in this way it is a learning resource to support collaborative learning through assessment design.

The findings are discussed in the light of the motivation for the research, in the context of developments taking place in Higher Education regarding the use of technology. In addition, the research is based on my beliefs and values, which have grown out of my engagement in the practice of learning and teaching in Higher Education. I strongly believe that more emphasis should be placed on learning processes and learner experiences rather than merely on subject matter. I also believe in engaging in a dialogue with

learners as co-participants and co-producers in learning in a learning environment that nurtures student relationships through collaborations and community learning. To this end, in this study I exploit a range of techniques to facilitate learning of subject matter making use of technology that includes a Wiki, Blog, podcast, video and the university MLE, especially the discussion facilities.

1.9 Thesis structure

Chapter 2 presents the literature that grounds the conceptual framework informing this research; concepts and theories placing this research into context.

The purpose of Chapter 3 is to show how practice used in the wider literature might be applied to the field of teaching and learning by presenting the role of the tutor in the practice of and the design of the face-to-face and technology learning environments and the associated learning materials.

Chapter 4 presents the research design and the methodology and reports how the research questions were carried out using the appropriate data collection techniques and a justification of the data analysis. This chapter also presents the ethical considerations and data management necessary to undertake this research.

Chapter 5 describes the method in operation, including the programme and module of study, the sampling strategy and a detailed description of study 1 and study 2, showing how the data analysis was undertaken.

Chapter 6 presents the results and a discussion of the results. Chapter 7 draws together the thesis and provides a concluding summary based around the conceptual framework. The original contribution to practice, ideas for future work and the limitations of the research are also presented.

The list of references and appendices brings the thesis to a close.

Chapter 2 Conceptual framework

“To experience what it is to be human we need to engage in dialogic relationships” (Garman and Piantanida, 2006: 4).

My aim in this chapter is to set out a conceptual framework for collaborative learning through technology, which is drawn from learner-centric, constructivist, and sociocultural perspectives. The principles of these perspectives are related to the concepts of online learning and collaborative technology in Higher Education in the United Kingdom. The conceptual framework is mapped to the three key research themes of **Tutor**, **Technology** and **Collaborative Learning** to answer the research question. This is necessary to underpin the learning design in this thesis with appropriate learning models, theories and concepts for the process of learning.

2.1 Learning as a sociocultural dialogic activity

This section defines collaborative learning and critiques the concepts and theories that underpin the key research themes - **collaborative learning** and **the tutor**.

The tutor centric traditional learning model is being superseded by learner-centric and sociocultural models as they take their rightful place in the underpinning of collaborative learning (Garrison, 2003; Garrison and Kanuka,

2004; Doolan, 2006). Learner-centric models tend to have specific traits that focus on learning rather than teaching, with an emphasis on context-specific learning such as solving 'real world' problems, providing opportunities for learners to build their own understandings and skills. With this in mind, the learner-centric model in Higher Education places emphasis on the tutor supporting learners as they socially construct knowledge (Vygotsky, 1978), collaboratively (Dillenbrough, 1999), in groups (Lewin, 1951; Brown, 1998; Thorley and Gregory, 1994); where learning is socially situated (Lave and Wenger, 1991) within a community of practice (Wenger, 1998). In this way, learning is not simply carried out by individuals but is socially constructed and situated, as, for instance, in a classroom. Participation is a key component in the acquisition of knowledge and takes place between teacher and learner and learner and learner. Hence the sociocultural model places emphasis on the fundamental role that social interaction plays in the process of learning and on the fact that social learning precedes development of higher order thinking, given that this takes place internally following the social interaction. According to Vygotsky (1978), people use mechanisms that develop from a culture, such as discourse, to mediate their social environments and to communicate, after which this development is internally built upon. This section considers appropriate theories in turn regarding **collaborative learning** and at times there is overlap with the key theme of **tutor** in this research.

2.1.1 Social constructivism

Social constructivists base their views on Vygotsky (1978) and view learning through participation and dialogue in social contexts (Lave and Wenger, 1991; Wenger, 1998; McConnell, 2004). Social constructivists (Vygotsky, 1978) argue that learners learn by constructing their own knowledge through active engagement and interactions with others. It is argued this is mediated by language in social discourse within a social cultural context. Thus, knowledge acquisition is context dependent rather than abstract and general. With this in mind, Vygotskian theory stresses the role of social interaction in the development of cognition. In this way, learners construct their own personal meanings and develop knowledge through their engagements with other learners. Thus, the social constructivist argument makes clear that there is no one 'truth' since 'reality' and 'meaning' are dependent upon the social context and this may be constructed, understood and interpreted differently given there are multiple 'truths' and 'realities' which are context-dependent for the learner. A key component in Vygotskian theory is a tenet of the research presented in this thesis, that of the collaborative, social and participative nature of learning, where the process of learning is situated in social interactional contexts. In this thesis, the learning activities are designed specifically to stimulate active participation between and within groups, where dialogue and practical activity converge (Vygotsky, 1978:24).

The Zone of Proximal Development Vygotsky (1978:86) is defined as *“the distance between the actual developmental level as determined by independent problem solving and the level of potential development as*

determined through problem solving under adult guidance or in collaboration with more capable peers". This concept was derived from his studies with children; it was observed that children learnt better whilst engaged in a learning experience with adults or other children who were more knowledgeable about the topic, or expert in the activity to be learned.

This has implications for learners learning collaboratively in this thesis. It is intended through the learning design that, through participation with others, the more knowledgeable learners will guide the less knowledgeable to understand concepts and promote task achievement (see Chapter 3).

The antithesis of social constructivism is the objectivist theoretical view (Jonassen, 1992; Lackoff, 1987). This view suggests there is only 'one' reality that exists independently of people with one basis of realism. Thus, the meaning of the world exists independently of the human mind and is external to the knower. An objectivist educator believes in driving the learning process as if teaching is something that is 'done' to the learner rather than the learner being an active participant in learning.

However, social constructivism is now repeatedly the dominant theory in education (Beetham and Sharpe, 2007) providing alternative models of instruction by (Bonk and Cunningham, 1998) "*placing the emphasis on guiding and supporting learners to understand the communities of which they are a part*" (1998:27) through learner centred and sociocultural activity. Hence deep learning and understandings are the result of a culture in

teaching and learning of a social context comprising social interactions, and collective negotiations through participations with learners and teacher whilst collaboratively constructing knowledge which is reinforced internally when an individual learner is learning alone, such as when studying course materials.

2.1.2 Authentic or real world learning contexts

As alluded to previously, whilst shifting the emphasis from teacher-centric to learner-centric models of teaching and learning there is a need to anchor such practice in authentic 'real' world learning contexts (Cohen and Ellis 2002; Ring and Mathieux, 2002; Gupta 2004). For learning to occur, activities need to be set in a meaningful context which is plausible to the student and presented to engage the student (Canole 2002; Schuell 1992; Biggs, 1999; 2003) and the activities need to be highly authentic, interactive and collaborative (Ring and Mathieux, 2002). Authentic learning places emphasis on learners working in groups on real-world problems relevant to practice (Donovan et al, 1999) to help learners make sense and make meaning of their learning (Duffy and Cunningham, 1996). Dewey (1916) posits that learners learn through engagement with real activities. Thus learners engage in learning when learning activities involve active participation and have meaning.

Race (1994) reinforces this theory through *the wanting, doing, feedback, digesting* model. These aspects interrelate and suggest that learners are not passive receivers of information and that there is a need for practical

application in terms of wanting to engage in learning, doing 'something', receiving feedback on what has been done to 'the something' and digesting, and assimilating the feedback in order for learning to occur. Piaget (1970) emphasises that conceptual development is achieved in learners through intellectual activity and found that children construct knowledge through activity and practice as opposed to simply absorbing information; thus learners develop knowledge through doing. Mayes and Fowler (1999) suggests that attention 'must be paid to the learners' activity', seeing learning as a process of guided construction of knowledge and cognitive processing (Goodyear et al, 2000) which results in the acquisition of new concepts, ways of thinking, the development of skills and knowledge thus changed behaviour. This echoes the view of Vygotsky (1978) for whom cognitive processes are developed through active engagement and interactions with others; this may be a teacher and/or learner. These authors highlight the importance of active learning as a significant component of learning and are relevant to this research, given that the learners engage in collaborative learning and the need for the tutor to design learning experiences conducive to learning. The next section discusses collaborative learning.

2.1.3 Collaborative learning

Collaborative learning is defined as a

"Situation in which 'two or more' people 'learn' or attempt to learn something together" Dillenbourg (1999:1).

Each key component of the definition is described by Dillenbourg (1999:1) as *“two or more” may be interpreted as a pair, a small group (3-5 subjects), a class (20-30 subjects), a community (a few hundreds or thousands of people), a society (several thousands or millions of people)...and all intermediate levels”*.

What is clear in Dillenbourgs' work is that collaborative learning provides the opportunity for students to work together in groups, share ideas, and to engage in discussing problem solving and critical thinking (Dillenbourg, 1999). Thus collaborative learning is distinctive in creating opportunities for learners to work together in groups. Collaborative learning in online collaborative learning communities has been shown to engage learners in knowledge sharing, to provide support, provide an environment where learners can depend upon another, negotiate and manage their own learning needs (Tu, 2004). Similarly Hiltz and Wellman (1997) argue that collaborative learning involves learners who are active and interactive. The argument is made that, through these actions and interactions, learners learn effectively through collective intellectual debate and discussion. Hiltz and Wellman's work used an asynchronous conferencing system where students were engaged in postings and responding to postings. In this work they argue that learners learnt by understanding each other's point of view whilst articulating their own. Construction of knowledge through collaborative learning is described by Marjanovic (1999:29) who claims, *“collaborative learning methods tend to encourage construction of knowledge, deeper understanding and greater skill development”*. This can be supported by technology (Hiltz,

1994; Garrison, 1997; Haughey and Anderson, 1998). Through collaborative engagements it is suggested that in situated contexts, for example the workplace, skills are fostered (Marjanovic, 1999) such as team work and interpersonal skills which are valued by employers (Bett et al, 1999, Doolan et al, 2006).

Given the preceding discussion it seems reasonable therefore, to suggest that collaborative learning be used as a means to learn in classrooms and beyond, given its application to social practices which are widely applicable, for example in small group discussions, whole class discussions, then between the class and the teacher in the classroom and beyond. The preceding discussion has also shown how collaborative learning supports a common action, mutual intellectual negotiation, the potential for collective decision making and that, through these, learners acquire knowledge and skills. Yet, in Higher Education, dominant theories of learning in the 21st century retain the notion of teacher as transmitter and mediator of information (Laurillard's 1999; 2001; Biggs 1997; 1998; 2003). For instance in Laurillard (2001) (see section 2.2.2 - conversational framework) the argument is made that learning needs to be mediated by the teacher as the teacher is a key to mediating or acting as mentor of the learning process.

Additionally, collaborative learning is discouraged due to concerns relating to plagiarism (Bruffee, 1973; Bower & Richards, 2006), unfair distribution of work and difficulties in attributing marks to individuals within groups (Bower & Richards, 2006). Peer assessment (Brown & Knight, 1994; Race et al, 1996; Habeshaw et al. 1998; Moon, 2002) can play a significant part in

collaborative learning such as a group presentation of shared artefact. Some institutions such as the University of Hertfordshire place restrictions on the amount of group work permitted. At times academics perceive group work as a means to deal with growing student numbers and reduced resources (Thorley and Gregory, 1994). That said, it is clear that collaborative learning provides the opportunity for learners to work together in groups, share ideas, and to engage in discussing problem solving and critical thinking (Dillenbourg, 1999) and therefore socially construct knowledge (Vygotsky, 1978). Collaborative learning over the decades has been shown to enable individuals to participate actively and meaningfully in group learning (Lewin, 1951; Bruffee, 1973; Trimbur, 1989; Dillenbourg, 1999; Janssen et al, 2010), deep and meaningful learning through active engagement with learning (Biggs, 1990; 2003; Cohen et al, 1992; Gibbs, 1983; 1992; Ramsden, 1987; 1988; 1992) and different learning styles (Entwistle 1988; Ramsden1988) (see section 2.3). Collaborative learning is regarded as a “*success story*” (Johnson & Johnson, 2009:365).

2.1.4 Group learning

Synonymous with collaborative learning as defined by Dillenbourgh (1991) is group learning. Lewin (1951) purports that learners in a group must perceive that each member is responsible for the groups learning as a whole and accept the interdependency between the relationship and the overall success of the group. This needs to be designed into the learning activities (Johnson, Johnson, and Smith, 1991). In this way, the case study has been shown to

support learners in the development of problem solving and critical thinking skills as a group (Gopinath, 2004; Kunselman and Johnson, 2004). Lewin (1951) suggests that people have different and separate needs when working in groups however, if group members share a common goal, such as a task, then, as a group they are more likely to achieve that goal. Thus the way in which learning tasks are designed is a key motivator for individual's engagement in group learning and goal achievement (Kohn, 1996).

Additionally, intrinsic motivation within individuals in groups has been shown to motivate individuals to achieve tasks (Johnson, Johnson, and Smith, 1991). It is clear that the group tasks need to be seen by learners within the group as a key component of group learning. This interdependence has been shown to be a motivator to complete tasks by individuals within groups (Brown, 1989). Additionally, in order for learning to be 'effective', the problem presented to learners needs to be such that each member of the group has a structured job to do (Crook, 2003) and this needs to be seen as authentic and plausible by learners (Canole, 2002).

Collaborative learning (Dillenbourgh, 1991:5) *"is not one single mechanism; if one talks about **learning from collaboration** one should also talk **about learning from being alone**"* (emphasis through bold added).

2.1.5 Situated learning

Based on Vygotsky's (1978) argument that knowledge is socially constructed, situated learning theory by Lave and Wenger (1991) posits that

learning is situated in context and occurs as a result of participation or engagement in social relationships and activity with others. The authors ask the question “*what kinds of social engagement provide the proper context for learning to take place*” (1991:14). Similar to Vygotsky’s work, social interaction is a key component of situated learning theory. However, what is uniquely different is that, rather than looking at learning cognitively as knowledge construction, it is argued that co-participation is the key to the acquisition of knowledge- a view shared by the collaborative learning theorists. Similar to collaborative learning theory, situated learning theory (Lave and Wenger, 1991) is based on the premise that learning is in the coming together of people, in the conditions that bring people together, situated in space and time and situated in activity in the context and learning environment and in the conversations that people have with each other, for instance, in the classroom. Additionally it is in the observations people make of themselves, others and in the learning environment. They further purport that a “*persons’ intentions to learn are engaged and the meaning of learning is configured through the process of becoming a full participant in a sociocultural practice*” (Lave and Wenger 1991: 29). The argument in Lave and Wenger’s work sees learners engaged through participations with others in a community of practice (see section 2.1.6).

This argument is supported by Wenger, (1998), and Wenger, McDermott and Synder (2002) and develops from (Vygotsky, 1978) argument that learning is socially construed through a sociocultural activity where learning occurs through participations with others and where knowledge is embedded in the

situated context. This resonates with collaborative learning theory which views learners working together socially in the context of groups, sharing ideas, and engaging in intellectual negotiations, discussions, problem solving and critical thinking skills (Dillenbourg, 1999) (see section 2.1.3).

Lave and Wenger (1991) further offer that learning in addition to being social is continuously evolving and renewed dependent upon one's view of the world and actions engaged in within the sociocultural environment. Thus, learning community theory is not only situated in a social practice, rather learning occurs through meaningful engagement with other participants in the social context.

Lave and Wenger (1991) and Wenger (1998) present an analytical view. They shift the focus on learning from the individual such as "in one's head" to the participation in and with the social world. In this way it can be perceived as the zone of proximal development (Vygotsky, 1978). As it applies to Lave and Wenger's (1991) work, facilitation by peers promotes knowledge development through collaborations, participation and peer interaction. This aligns with the community of practice concept (Wenger, 1998) where the argument is made that peer interaction, mutual engagement, negotiation, co-participation and co-construction are key to the development of community knowledge and at the same time the development of individual members' knowledge. With this in mind, community knowledge develops through mutual engagement or collaborations (Dillenbourg, 1991) as individual knowledge develops (Bielaczyc and Collins 1999; Gherardi and Nicolini, 2000; Johnson, 2001).

Collaborative learning and situated learning theory are synonymous concepts.

In this thesis learning is through the relationships and conditions that bring learners together, in and out of the classroom, through collaboratively engaging in groups of six, to complete learning activities, situated in authentic contexts simulating 'real world' experience, which encourage learners to practically apply software development problem solving techniques to help develop the required knowledge and skills for the workplace (see section 3.4.2 in Chapter 3). In this way, learning is situated in the learning activities undertaken by the groups within clear time-lines as would be the case at work. Additionally, learning is encouraged through social interaction and collaboration in and beyond the classroom such as whilst engaging with peers using the Wiki provided to support the collaborative experience.

Social interaction and collaboration are both essential components of situated learning theory (Lave and Wenger, 1991).

The next section agrees with community of practice theory to support the concept in this thesis of collaborative groups as communities of practice and that learning occurs through participation and a sense of belonging in the social context.

2.1.6 The community of practice

Community of practice theory is built upon Vygotsky (1978) social learning theory that supports the notion that knowledge acquisition is through participation with others. The community of practice theory further builds upon situated learning theory (Lave and Wenger, 1991) which views learning as embedded within social activity, social context and a social culture. Thus communities of practice essentially practice social learning in social experiences where meaning is constructed and formed through dialogic negotiations with others through these social experiences within the community of practice. These negotiated meanings are formed through participation where participators actually take part and relate to others in the community of practice. The practice exists *where "people are engaged in actions whose meanings they negotiate with one another"* (Wenger, 1998:73).

Wenger (1998) suggests communities of practice are a part of peoples' everyday lives from the home, family to the workplace including educational settings. *"Communities of practice are everywhere"* (Wenger 1998:6) and the communities we belong to throughout life will change over time. These communities can be small, for example a group, or large such as a university. Thus the community in the community of practice implies learning is social, involves mutual engagement and respect, and a willingness to share; interaction is a necessity to keep the community alive, one that is open in nature and open to questioning. According to Wenger (1998) within communities of practice there is a sense of belonging amongst participants where trust and goodwill are shared in the community. Wenger (1998)

argues that communities develop over time a developed culture, characteristics, beliefs, shared practice, assumptions, rituals, behaviours and roles that define the community (Wenger, 1998).

In the community of practice concept, Wenger's work talks of practice within the community as developed over time, shared and maintained by engagement in knowledge and in the sharing of ideas and artefact such as rules, technology, products, documents, ideas, stories and crucially knowledge. Hence, Wenger (1998) argues that through the community of practice knowledge development is promoted through sharing and as a result helps community members to develop skills such as problem solving. The community of practice is defined by Wenger, McDermott and Snyder (2002:4) as a group of people

“who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an on-going basis”.

Importantly the purpose of community of practice is to share, create, expand and exchange knowledge through participation with others who may help to advance individual knowledge and skills (Vygostky 1978; Lave and Wenger 1991; Wenger, Mc Dermott and Synder 2004).

Additionally, a community of practice may comprise

“project teams, to accomplish a specified task, belonging to people who have direct role in accomplishing the task, the boundary is defined as clear, what holds the community of practice together is the project goals and milestones.

Such a community of practice has a predetermined ending” related to the project completion (Wenger, 1998:42).

Thus the community of practice concept is strongly related to group learning (Lewin, 1951) and collaborative learning (Dillenbourgh, 1999) theory.

It could be argued in this thesis a community of practice comprises the groups of six learners collaboratively undertaking the assessed learning activities and the tutor and support provided within and across groups studying on an Information Systems Development module (see section 3.4.2 in Chapter 3).

The concept of collaborative teams as communities of practice to solve authentic problems is reported by Wick (2000). A study was conducted which related to groups of professionals who completed similar tasks and shared the tasks through communicating within and across groups to cross-fertilise expertise in order to promote learning. In this way this makes concrete Wenger’s (1998) notion of groups as communities of practice. Additionally, Squire and Johnson (2000) build on the community of practice concept where practice fields are designed to stimulate learning with authentic content for learners whilst role-playing to solve authentic problems. Chapter 3 builds upon these concepts in the learning design. The next section critiques cognitive development and influences on behaviour through interactions in social learning contexts, given its relevance to social learning as the basis of **collaborative learning** theory which is a key concept deeply rooted in this thesis.

2.1.7 Social learning cognitive theory

Bandura's (1977) social learning cognitive theory reports on social learning and the continual interaction between the environment, cognition and behavioural influences with others in the social environment. Relating to behaviour, Bandura (1977) posits that by observing other people carrying out a particular activity we learn from this observation and demonstrate this learning by mimicking and imitating the observed behaviour. In this process, one forms an idea of new behaviours based on others' actions, and thus learning occurs when individuals observe and imitate others' behaviour whilst in a social context. Therefore by observing another the observer can watch the action and the consequence of the action and model this behaviour, and while the learning actually takes place in "one's own head", it is influenced by the behaviour of others in the social context. Hence observational theory relates to attending in one's own head to behaviour, remembering this and acting out the observed behaviour. For example, by modelling a more knowledgeable other, learners may develop their zone of proximal development (Vygotsky, 1978).

Behaviour is more likely to be modelled by a learner when the person being modelled has admired status (Bandura, 1997). This could be through being a more knowledgeable other (Vygotsky, 1978). Hence, the modelled learner brings functional value to the modeller such as guidance on completion of task. There are similarities between Lave and Wenger (1991) situated learning theory and Bandura (1997) behavioural theory in that both view learning as knowledge accrued by co-participation. Additionally the nature of

the situation impacts on the learning process. Common to sociocultural, cognitive and behavioural theories is that learning involves cognition and takes place in “one’s own head”, which is promoted by participation as a key component of learning. It is argued that this takes place through dialogue and social interactions situated in social contexts. Situated learning theory (Lave and Wenger, 1991) offers learning as derived through relevant activities which are the rationale for bringing learners together. It is argued that learning does not belong in an individual’s head but rather in the dialogue in which a learner participates. Wenger’s (1998) community of practice theory encourages such participation in learning through mutual engagement which, it is argued, enhances the learning which takes place in one’s own head. This view is supported by cognitive apprenticeship (Dillenbourg et al, 1994). However, in earlier work Dillengborough (1991:5) states, *“peers do not learn because they are two, but because they perform some activities which trigger specific learning mechanisms”*. Similarly, Savery and Duffy (1994) describe a learner model to support authentic and situated contexts. The components of this model are: *cognitive* concepts which are the stimulus for learning and determine the organization and nature of what is learned and that understanding is gained through interactions with authentic cases and in situ. Seeing learning as a process of guided construction of knowledge means that attention must be paid to the learner’s activity and cognitive processing (Goodyear et al, 2000). Thus it is argued that learning occurs in situated rather than non-situated contexts as they provide richer sources of knowledge.

To summarise the argument thus far, there is a consensus that learning as a sociocultural activity is seen as the inter-relationship between the theories critiqued thus far, that of knowledge acquisition, social, group, collaborative, situated, cultural and authentic learning. This view is supported by Lave and Wenger (1991), Wenger (1998), Wenger, McDermott and Synder (2002), Vygotsky (1978), Dillenbourgh (1999), Lewin (1951), Brown (1998) and Thorley and Gregory (1994).

The social paradigm built upon in this thesis views the social and cultural context of learning as crucial and a central tenet of learning itself. Furthermore in this thesis it is argued that learning occurs through participation, negotiation and a dialogue with others whilst situated in the context of learning in groups through assessed learning activities using technology (see section 3.4.2 in Chapter 3).

The learning supports learners taking part in authentic learning activities to develop knowledge and skills (Johnson, Johnson, and Smith, 1991; Gopinath, 2004; Kunselman and Johnson, 2004; Gupta, 2004) facilitated by the tutor (Collis 1996; Salmon and Giles, 1995; Palloff and Pratt 1999; Goodyear et al, 2000; Squire and Johnson, 2000; Salmon, 2002; Biggs, 1997; 1998; 2003; McConnell 1994; McConnell et al, 2004) in class and by each other out of class.

Learning in this thesis takes place in an applied technology and class based setting which is purposely built to support learners in undertaking learning activities similar to the workplace and especially

related to the assessment (Brown, Collins and Duguid, 1989, Palloff and Pratt 1999; Biggs 1997; 1998; 2003; Tu, 2004; McConnell et al, 2004) to bring authenticity to learning (Gupta, 2004).

Dillenbrough (1999) cautions that in collaborative learning learners are expected to interact, and that this may not occur without guidance. Hence he offers four categories to assist: *to set up initial conditions* such as the group, *to over-specify the collaboration contract with a scenario based on roles*, *to scaffold productive interactions by encompassing interaction rules in the medium* such as in the design of learning and *to monitor and regulate interactions*. In this way the tutor takes on the role of facilitator of learning, helping to guide the learning process. This is critiqued in the next section. These concepts are embedded in **collaborative learning** as a key research theme and overlap with the key research theme **tutor** in this thesis.

2.2 Teacher-centric models

This section critiques the role of the tutor as a facilitator and argues that the teacher-centric model used in Higher Education places emphasis on the tutor supporting learners as they learn (Laurillard's 1999; 2002; Biggs 1997; 1998; 2003). These theories bring clarity to the role of the tutor and the key research theme **tutor** to address the research question.

2.2.1 The tutor's role as facilitator

According to Collis (1996), Salmon and Giles (1995), McConnell (1994) and McConnell et al (2004) the tutor manages the learning and teaching process online by acting as a facilitator of learning. Palloff and Pratt (1999) and Squire and Johnson (2000) support the notion of a facilitator. The former argues that learners need encouragement in online discussions. The latter argues that rather than providing content or information a tutor should act as a facilitator. Littleton and Whitelock (2004:173) states the need for "*facilitation of discourse for the purpose of building understanding*" in online collaborative learning and that the tutor has a role in promoting discourse amongst learners.

Salmon (2002) views the teacher as moderator and that a learner may also act as a moderator in an online learning domain. Salmon's work views the learners as participants and states that learning occurs through interactions with others. It is argued that when the tutor acts as a facilitator in a community of practice that peer interactions, negotiation and co-construction of the community is encouraged (Bielaczyc and Collins, 1999). However, Brookfield (1986), Boud (1988) and Knowles (1990) whilst referring to student centric learning approaches argue that tutor intervention is not so important, but rather learners learn by observation and experience. This aligns with the behaviourist theories of learning as influenced by cognition, behaviour and the environment (Bandura, 1997), social constructivism (Vygotsky, 1978) emphasising social interaction, the zone of proximal developmental and the more knowledgeable other. Additionally, in Lave and Wenger's (1991)

situated learning theory, Wenger (1998:228) suggests “*learning cannot be designed: it can only be designed for – that is, facilitated or frustrated*”.

In this thesis the tutor takes on the role of facilitator whilst designing for learning (see Chapter 3).

The next section discusses a dialogic approach to learning with the focus on the relationship between the teacher and the learner.

2.2.2 The conversational framework

Laurillard (1993) offers learning as an iterative process comprising *discursive, adaptive, interactive* and *reflexive* components with the main focus on teacher and student relationships. This work argues that teachers have a responsibility for their students’ learning given that the university controls student learning. Laurillard (1993) argues that learning needs to be mediated by the teacher.

In later work Laurillard (2001) offers the conversational framework in Figure 2.1, developed as a result of the introduction of technology into teaching and learning. The conversational framework offers teachers a continuous dialogue model. The model in Figure 2.1 is based on a dialogue with teacher and learner, learner and teacher. However, although the model is built upon the concept of social interaction and social learning, as the model is teacher-centric; there is no conversation between learners. Moreover, the model supports Laurillard’s earlier work in 1993 and sees the teacher as a key to mediating or acting as mentor of the learning process. This aligns with the

notion of the tutor as a facilitator of learning (Collis 1996; Salmon and Giles, 1995; McConnell 1994; McConnell et al, 2004; Palloff and Pratt 1999; Squire and Johnson, 2000).

The conversational framework suggests the dialogue that would take place in a class-based situation and applies the need for conversation, such that the learning that stems subtly from it into explicitly defined interactions can be applied into the development of technology-based learning material. Feedback remains a central feature, resulting in changes in learner behaviour that purport to show that learning has taken place by both the teacher and the learner as progress is assessed and reflected upon by both parties. The progress is therefore formed by an informal agreement between the tutor and learner with both sides fully engaging in a conversation with the other.

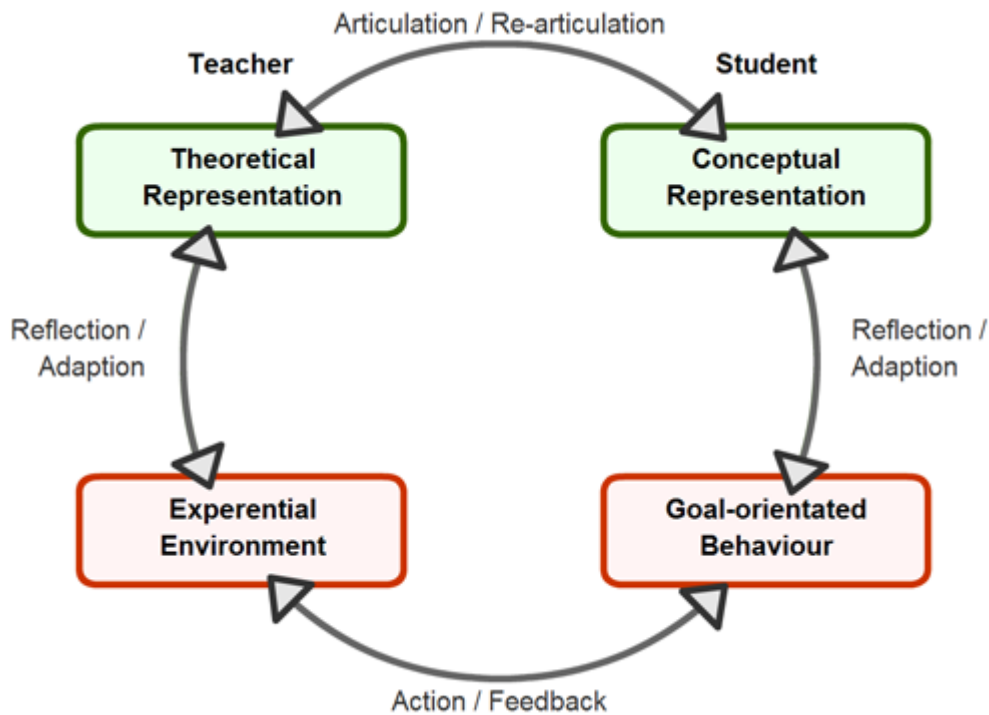


Figure 2.1: Conversational framework (Laurillard, 2002:87)

Laurillard's work is built upon social interaction and learning hence it can be argued that knowledge is constructed socially (Vygotsky, 1978) between the teacher and the learner. Laurillard's work is in the form of a dialogic approach between the teachers, who hold the knowledge, acting as mentors of learning, guiding the learner through discourse. The teacher acting as a mentor in this way supports learners whilst constructing knowledge and sense-making to reach their zone of proximal development (Vygostky, 1978). The main focus of Laurillard's work is on the relationship between the teacher and the learner.

There is no talk of mutual engagement and co-participation (Wenger, 1998) social interaction (Lave and Wenger, 1991; Wenger, 1991) and

collaborations with peers (Dillengborough, 1999). Laurillard's work also fails to denote learning as a sociocultural activity, which is a key component of learning in this thesis (Lewis, 1951; Vygotsky, 1978; Brown, Collins and Duguid, 1989; Lave and Wenger, 1991; Hiltz & Wellman, 1997; Wenger, 1998; Dillenbourg 1999; Wenger, McDermott and Synder, 2002). Furthermore, Laurillard's work fails to talk of learning in authentic contexts (Naidu et al, 2000, Gupta, 2004; Doolan et al, 2006), also a key component in this thesis.

2.2.3 The 3P model of learning

Biggs (2003) offers teachers the presage, process, product (3P) model of learning as shown in Figure 2.2. The 3P model is an example of driving the teaching process of learning. What is clear in this model is the teacher plays a key role in promoting learning. Biggs (2003) 3P model is represented in this chapter as an example of a model developed before the introduction of technology into education but is very relevant and inspires and informs learning using technology.

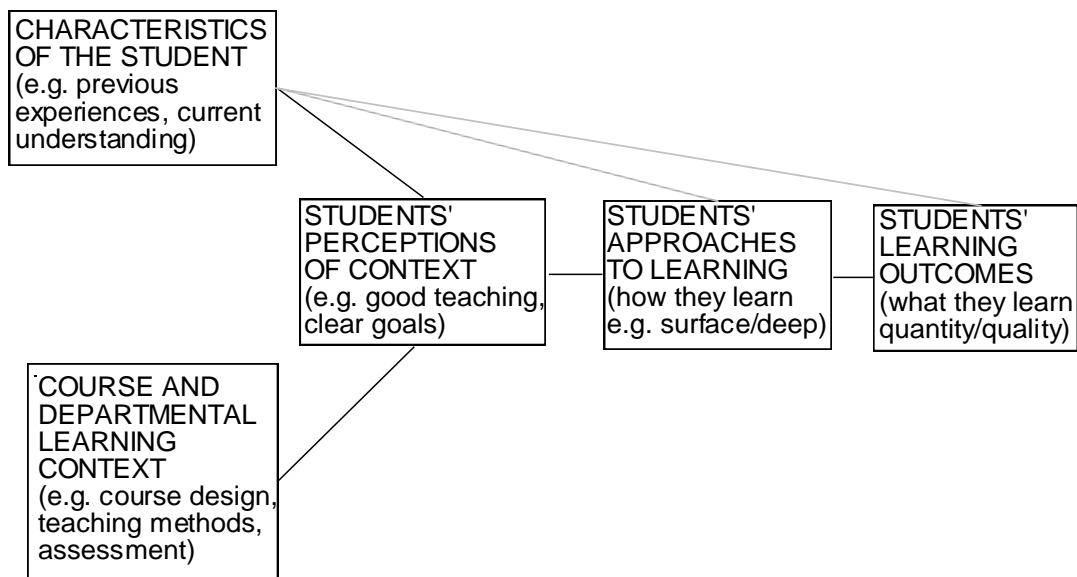


Figure 2.2: The 3P model (Biggs, 2003:19)

Presage factors include students' previous experiences together with the teaching context relating to the teachers' expertise of subject matter and the teachers' interest in their subject. The *Process* relates to teaching and learning activities and teaching methods used. The *Product* relates to the learning outcomes. In Biggs' work the premise is that good teaching aligns teaching methods and assessment to the learning activities and these are made known to learners as learning objectives that are explicitly stated and communicated to learners. This concept is known as 'constructive alignment' (Biggs, 2003). In this thesis strictly the module aims and intended learning outcomes were aligned with the content delivery and assessment. These were made known to learners on assessment documentation in Appendix B.i. The following section argues that the learner-centric model used in Higher Education places emphasis on the tutor to support learners to foster deep approaches to learning. These theories bring clarity to the role of the

tutor and the key research theme **tutor, collaborative learning** whilst using **technology** to address the research question.

2.3 Deep and surface learning approaches

There is much written about deep and surface learning approaches (see for example Biggs, 1989; 2003; Cohen et al, 1992; Gibbs, 1992; 1983; Ramsden, 1987; 1988; 1992) who cite ways to foster deep learning approaches as opposed to the development of surface approaches by learners. Evidence from Biggs' (2003) work shows ways to enable students to go beyond surface learning. According to Gibbs (1983), Entwistle (1988) and Ramsden (1988) getting the learning design 'right' is crucial to promote deep approaches. This view was formed as a result of an investigation into students' strategies towards learning. Additionally, Prosser (1987) studied the relationship between cognitive structures and learning strategies. This work found that students adopt both surface and deep approaches to learning.

A surface approach to learning is based on recall of facts. According to Biggs (2003) this may be sufficient, for example, in tests of factual recall. However, it is argued that using this surface approach, following the test, learning tends to be forgotten after a short time. Earlier research undertaken by Marton and Säljö (1976; 1984) found that the student reduces what is being learnt to the status of unconnected facts to be memorised. It is evident the learning task is to reproduce the subject matter later for example, in the

exam. In contrast, a deep approach (Biggs, 1989; 2003) necessitates a deep understanding of facts presented by the teacher. According to Biggs (2003) inappropriate course design will lead to the adoption of a surface approach by the learner. It is apparent from the 3P model as shown in Figure 2.2 that teachers through, for example, course design, teaching methods and assessment are responsible for the approaches adopted by learners, particularly by the way in which learning activities are set and the way in which the learning environment is constructively aligned (Biggs, 2003).

Biggs (2003) goes on to argue that the interest of a teacher in the subject matter and the demonstration of this interest to learners helps to encourage learners to adopt deeper, more meaningful approaches to learning. On the other hand a surface approach to learning is achieved through the teacher showing little interest in the subject matter, setting trivial learning activities that require recall of facts and may occur through inadequate learner feedback by the teacher. The evidence from the literature of Biggs (1989; 2003), Cohen et al (1992), Gibbs (1992), and Ramsden (1987) shows that activities designed by the teacher help in promoting a deep approach to learning. This has been shown (Duffy and Cunningham, 1996) to result in the student making more sense of what is to be learnt and gaining more of an understanding of ideas and concepts. This involves thinking, seeking integration between components and between tasks, and playing with ideas. These are supported by teachers anchoring learning practice in situated (Lave and Wenger, 1991) (see section 2.1.5) and authentic 'real' world learning contexts (Dewey, 1916; Cohen and Ellis 2002; Ring and Mathieux,

2002; Gupta 2004) (see section 2.1.2) that are meaningful, plausible and relevant to practice (Donovan et al, 1999; Canole 2002; Schuell 1992; Biggs, 1999; 2003).

Biggs (1990) suggests that a surface approach, almost without exception, leads to a quantitative outcome of unstructured detail and a deep approach to an appropriately structured learning outcome.

As shown in Figure 2.2, to help learners to foster a deep approach there appears to be a need for teachers to consider student characteristics and student perceptions of what constitutes 'good' teaching; this may be judged, for example on how clearly the teacher sets learning goals and whether feedback on learning helps to move learners forward in their understanding of concepts. It is suggested by Biggs (2003) that these considerations need to be planned for in the course design, methods and assessment to support learning as shown in Figure 2.2. In this way once learning activities set by the teacher stimulate learners in active engagement, other learners will help to expand knowledge, share support and guide each other to participate in their learning when working collaboratively in social, group and community contexts (Lewin, 1951; Wenger, 1998; Vygotsky, 1978, Dillengborough, 1999).

To encourage students to adopt a deep approach to learning Biggs (1989) describes four key elements:

1. Motivational context - deep learning is more likely when students' motivation is intrinsic and when the student experiences a need to know something.

2. Learner activity - which means the students need to be active rather than passive. Deep learning is associated with doing. The learning activity needs to be planned, reflected upon and processed and related to abstract conceptions.
3. Interaction with others - it is often easier to negotiate meaning and to manipulate ideas with others than alone.
4. A well-structured knowledge base - without existing concepts, it is impossible to make sense of new concepts. The subject matter being learnt must be well structured and integrated and related to other knowledge rather than having been learnt in isolation.

Biggs (2003) specifies the need to make clear to learners the teacher's expectations of learners to support learning. This relates to and supports Chickering and Gamson (1987) who offer teachers the seven principles of 'good teaching practice' to support teachers as follows:

1. Encourages contact between learners and faculty
2. Develops reciprocity and cooperation among learners
3. Uses active learning teaching
4. Gives prompt feedback
5. Emphasises time on task
6. Communicates high expectations
7. Respects diverse talents and ways of learning

(Chickering and Gamson, 1987)

These principles are offered by Chickering and Gamson (1987) as good practice for teachers to support learners.

In this thesis contact between teacher and learner and between learners is promoted. Additionally, reciprocity, and co-operation between learners and with the tutor is encouraged through the assessment design in Chapter 3. In the assessment design, learning activities are designed to promote active learning between learners (Dillengborough, 1999; Lewin, 1951; Brown, 1998; Thorley and Gregory, 1994) and with the learning environment (Wenger, 1998). Learners are encouraged to communicate their expectations of their collaborative working practices with themselves and other group members. These culminate into a group commitment. Learners are expected to show evidence of meeting this commitment. This includes respecting the diversity within and across groups and the cohort of learners.

Laurillard (2001) supports such dialogue in the conversational framework although this work views the teacher as mentor and a dialogue between teacher and learner. A dialogue between learners is supported by (Wenger, 1998; Vygotsky, 1978) where learners are participants in the learning process (Lave and Wenger, 1991; Wenger, 1998; Wenger, McDermott and Synder, 2002). The next section discusses blended learning and computer supported learning to bring clarity to the role of the technology and the key research theme **technology** to address the research question.

2.4 Blended learning

Blended learning has multiple definitions. For the purposes of this thesis, definitions which combine technology and face-to-face learning are considered. This aligns with the view that the majority of blended learning approaches that are used in Higher Education purport to combine technology and face-to-face contact (Garrison and Vaughan, 2007; Littlejohn and Pegler, 2007; Sharpe et al., 2005).

Mac Donald (2006: 2) asserts that blended learning is *“associated with the introduction of online media into a course or programme whilst recognising merit in retaining face-to-face contact”*.

The University of Hertfordshire defines blended learning as *“educational provision where high quality e-learning opportunities and excellent campus-based learning are combined or blended in coherent, reflective and innovative ways so that learning is enhanced and choice is increased”*(HEFCE, 2004).

Garrison and Kanuka (2004:9) find *“Blended learning is consistent with the values of traditional Higher Education institutions and has the proven potential to enhance both the effectiveness and efficiency of meaningful learning experiences”*.

Garrison and Vaughan (2007:9) view blended learning as *“the thoughtful fusion of face-to-face and online learning experiences”*. *“Students actively engage with the technology alongside traditional face-to-face meetings and class contact”* is stated by Doolan et al (2006: 14).

Critics of 'blended learning' argue that the term 'blended learning' is *"ill-defined and inconsistently used"* (Oliver and Trigwell, 2005: 24). However, what is important, argue Beetham and Sharpe (2007) is that the technology used is effective in meeting the needs of the learners' context.

Blended learning is widely used to enhance learning. (Garrison and Kanuka, 2004) explored how various instructional strategies transferred to text-based Internet learning environments, and the effectiveness of these in facilitating higher levels of learning. The results showed that the instructional strategies under investigation translated effectively to the online classroom and that some strategies used were more effective than others at creating the conditions necessary to facilitate higher levels of learning.

MacDonald and McAteer (2003) explored strategies for blended learning in distance and campus based environments' at the Open University and at the University of Glasgow. This work focused on tutors and the use of different media blends to provide learning support. A comparison was made between distance and campus based learner support models and the different media blends used by the tutors. The results showed that written, email and face to face interaction was dominant in the distance and campus based environments under study. Where VLEs were used computer mediated conferencing featured in the results.

Doolan (2004) and Doolan and Barker, (2005) made a comparative study between online and offline group learning, evaluating the use of the institutional managed learning environment. The results showed that

students performed better in the online environment than offline, however students reported their preference for working offline using face-to-face group learning.

Sharpe et al (2005:2) carried out a review of over 300 studies on blended/e-learning on behalf of the Higher Education Academy in order “*to understand methodologically sound evidence of the impact on blended learning on the student experience*” in order to help guide policy, research and practice across the HE sector. The study showed that there were three ways that blended learning was being used: to supplement resources for campus based course delivery, course redesign where technology was used to replace other modes of teaching and learning to facilitate interaction and communication. The study also found that some learners took a holistic view of their learning that included using their own technology to support their own learning. However, the use of learners’ own technology used in a holistic way to support learning was, in this study, under-reported and under-researched. Sharpe’s work highlighted the rationale for blended learning across the institutions studied and found that blended learning was contextualised and specific to an institution which included flexibility in provision, enhancing campus based provision, supporting diversity, efficiency and operating in a global context.

Doolan et al (2006) used a blend of technologies to support collaborative assessment in Computer Science, Health and with Radiography at the University of Hertfordshire.

In Computer Science Blogs, Discussion Forums and a Wiki were blended with on-campus learning to support group-based assessment. Group areas in the institutional Managed Learning Environment were utilised with students in Health to provide choice and support for groups undertaking assessed presentations in and out of class.

In the School of Radiography the blended approach to assessment comprised the institutional Managed Learning Environment and three assessed tasks which were found to support different learning modes for professional learning. What was common in these studies was that tutors promoted a mix of tasks where problems could only be addressed through a shared group consensus.

In the School of Physiotherapy and the School of Computer Science this resulted in high levels of student engagement with peers using the technology. A survey in the School of Physiotherapy revealed that 98% of learners rated the use of the MLE as 'very useful'. They valued the opportunities that the technology afforded to voice concerns and request clarification from others. Learners also highly rated the use of the technology as a repository for future reference, to broaden knowledge and to express and receive other points of view. In the School of Computer Science a statistical counter embedded in a Wiki showed the majority of engagement

took place on Thursday when the students were timetabled for the module. Results showed that students were working throughout the week, but with higher levels of activity on Sunday than Saturday. As might be expected there was a natural progression in learner activity (3,539 page loads) on the Thursday prior to the Tuesday assessment submission day. Thus in these different disciplines using technology in a blend to supplement class based student contact was deemed by the students to enhance the collaborative learning experience.

In the School of Radiography results showed that the first assessment was deemed to be successful by the students. However, for the second assessment one group experienced problems with working and relating with each other. It was reported that this group completely broke down and thus were unable to continue working together. The group failure was not deemed to be the result of technology rather of poor group dynamic and ill-prepared students prior to undertaking the group work. Thus it was found that problems experienced between group members impacted on the collaborative learning experience, the use of technology and task completion. Additionally, it underlined the importance of meaningful student preparation prior to the start of the group work.

The studies in the School of Physiotherapy and the School of Computer Science showed that learners in addition to the development in subject knowledge also developed work related skills, such as working and relating to others and this argued the relevancy for industry, in that employers want

graduates with such transferable skills (Harvey & Mason, 1996; Dearing, 1997; O'Neil, 1998; Doolan & Barker, 2005).

Blended learning has been demonstrated to maximise the pedagogic benefits of face-to-face and online learning (Doolan 2004; Doolan and Barker, 2005). However, Vaughan (2007) and Tabor (2007) caution that when using a blended approach in learning that learners may perceive fewer face-to-face classes as needing to do less study. Indeed it has been argued (Doolan et al, 2006) that collaborative and blended learning approaches are seen as a way of dealing with large student numbers in the context of the UK government's wishes as set out in the White Paper to widen participation thus increasing student numbers and producing lifelong learners in Higher Education (Dearing, 1997).

Although now over ten years old the issues raised by increased student numbers still have relevance in UK Higher Education today and are influential in the rationale for using blended learning in the UK Higher Education sector (Sharpe et al, 2005). In reporting on 300 studies of blended learning published since 2000 and deemed to be representative of UK Higher Education learning environments, widening participation was a key component of the institutional blended learning agenda.

Doolan et al (2006) argue that technology when blended with face-to-face learning can be used as a strategic resource. In this work, this is perceived as a way of supporting teaching, learning and assessment with large student numbers. Indeed in a recent report into Higher Education (DBIS, 2009)

highlighted in 0, the United Kingdom government commitment to technology to meet learner expectations and provide flexible learning opportunities and a shift towards more distance learning is outlined. In line with this, the University of Hertfordshire 5 year strategic target is to deliver 25% of its educational provision through distance learning (UH strategy, 2010).

The infrastructure, such as the University of Hertfordshire MLE, is available, has been in use since 2001, and has been investigated for its potential to support collaborative and blended learning (Doolan, 2004; Doolan and Barker, 2005; Doolan et al, 2006, Doolan 2006; Doolan, 2007a; 2007b; 2007c; 2008; 2009; 2010a; 2010b). It is argued by Littlejohn and Pegler (2007) that using technology in a blended mode provides flexible opportunities in space and time to accommodate learning. Blended learning provides opportunities for learners to choose when it is convenient for them to learn (Altree and Thornton, 2004; Doolan et al, 2006).

However, complexities of blended learning relate to the teacher and how 'best' to decide upon the 'right' blend to promote learning. Doolan (2006: 53) recommends *"the most effective blend is by maximising the pedagogic opportunities afforded by each methodology, often requiring module redesign, including a review of assessment practices"*. This approach requires commitment by the tutor and an up-front investment in tutor time, but can result in a much more engaging and richer student learning experience (Sharpe et al, 2006).

According to Garrison and Kanuka (2004) effectiveness of blended learning has yet to be demonstrated. It is common amongst these texts that the most 'effective' equilibrium or 'blend' between class based and technology based learning is as yet unknown. There is a need for clarity of the *"how much, or how little online learning is inherent in blended learning"* (Garrison and Kanuka, 2004:96). The concept of blended learning is central to this study in the context of a blend of face-to-face and Web 2.0 technology including a Wiki, Blog and Podcast learning environment where learners engage in collaborative learning. To this end the Wiki, Blogs, and Podcasting as Web 2.0 technologies are critiqued in the next section.

2.5 Wikis, Blogs and Podcasts

Technologies such as Blogs, Wikis and Podcasts are being used increasingly in Higher Education (Kennedy et al, 2009; Judd et al, 2010). A Blog is authored solely by one person, however it allows for others to make comments on the author's posts. It has been shown to be useful as a personal journal providing features for linking and uploading files (Goodwin-Jones, 2003). Additionally, Blogs in education have been used to provide opportunities for greater interaction with peers off-campus which has been shown to promote learner autonomy (Williams and Jacobs, 2004). Zhang and Olfman (2010) used Blogs to support constructivist and social learning in a university setting with students studying Information Systems. Blogs have also been used as a research tool with Information Systems students studying at the University of Hertfordshire. In this work, Doolan (2004) and

Doolan and Barker (2005) undertook content analysis on 111 Blogs and related themes specifically to theoretical and practical concepts relating to the student experience and collaborative learning supported by technology. In later work, Doolan (2009; 2010a) undertook content analysis on 96 and 60 student Blogs respectively to capture the learners experiences of using social media such as Blogs, Wikis and Podcasts for collaborative learning.

The Wiki concept was born in 1995 by Bo Leuf and Ward Cunningham (Leuf and Cunningham, 2001). A Wiki is an example of one of a group of social networking technologies known as Web 2.0; others include Blogs and Podcasts. The Web 2.0 and Wiki concept is examined in the next section in more detail as the Wiki is a central tenet of this study and supports the key research theme **technology**.

Podcasts are essentially audio files and have been used for some educational purposes. Podcasting has been shown to engage learners in constructive learning on a multimedia module in Computer Science at the University of Hertfordshire (Barker, 2007). Dale (2009) explored the use of Podcasts for developing user-generated content in a third year undergraduate programme. In groups students produced a collective Podcast generating content that could be shared with other learners. Results showed that, given the practical nature of the podcast development, students were motivated to engage in their learning and adopted an active approach to learning. Furthermore, students were shown to take responsibility for their own learning and the learning of others. Podcasts have been shown to be

effective in developing collaborative and social learning (Alexander, 2005; Ractham and Zhang, 2006).

Additionally Podcasting has been used at the University of Hertfordshire as part of a large JISC funded project (Stewart and Doolan, 2008) with law students engaged in collaborative experiences to support authenticity in professional learning by using audio to simulate real-world scenarios. Recordings were produced in class by learners following their study of an audio recording provided by the tutor to prepare for the in-class learning activities. Results from this study showed that, as staff became more proficient and confident, they were keen to explore new ways of supporting learners in the practice of collaborative learning and shifting more emphasis onto the learner to become more of a facilitator of learning. This study showed that the tutor role progressively changed from didactic to a facilitator of learning following the appropriate and timely support from a student mentor. The study also found the need to provide one-to-one support for tutors to use the technology and to adapt the technology to suit the learning and teaching context.

Doolan and Simpson (2010) investigated the use of audio in the Business school at the University of Hertfordshire. In the first instance students were required to record a group discussion based upon their reading of a peer-reviewed journal article. Learners were then required to edit their audio recording to submit as part of the assessment. The stipulation by the tutor on time was six to eight minutes. This was intended to help with managing marking the assessment. In collaborating to create this audio file, the tutor

reflected that the students seemed to put more work into preparing this presentation than in previous years when audio was not used. The tutor reported that the use of audio as a learning tool to support the assessment was more effective than in previous years when audio was not used.

However, the second use of audio with 280 students to provide feedback on assessment was problematic. The tutor managed to record feedback for 50 students. Problems were encountered in getting assessment feedback to students. Using the institutional managed learning environment and the Business school's feedback forms in conjunction with recording feedback was time consuming and awkward. Using MP3 recorders to record the assessment feedback meant that tutors could not easily identify which student the recording related to, and in the end they had to stop between each recording, upload and name the audio file provided by the learner to the tutors' personal computers. Therefore, it was deemed important when using audio in this way, to be provided with the appropriate resources to help tutors to choose the most appropriate recording device and to find a fast and efficient way of identifying and sending the assessment feedback to students.

Hendron (2008) found podcasts created by students bring authenticity and excitement to the student learning experience.

Stewart and Doolan (2008) examined the use of audio to record and transmit speech, to support, enhance and personalise the learner experience at two UK universities, namely the University of Bradford and the University of

Hertfordshire. The project explored and evaluated the use of audio in three key areas of teaching and learning: self-reflection and self-assessment, formative and summative feedback, and collaborative learning and within some of the new and emerging technologies such as Wikis and social networking spaces to support teaching and learning. The project studied a diverse range of learners: undergraduate and postgraduate, campus learners and distance learners across different disciplines including Health Studies, Management, Optometry, Computing, Accountancy and Law. The project led to modification and refinement of learning and teaching practices in the six disciplines across both institutions. The studies showed that audio as part of a blend with face-to-face learning was a powerful tool, providing opportunities for personalising learning, promoting greater student engagement, and encouraging creativity.

In introducing audio into their practice, lecturers reported that they had the opportunity to reflect on their pedagogical approaches and learning design, which helped whilst adopting new and innovative ways to enable their students to be more actively involved in the learning process. Using audio for assessment feedback, lecturers reported a more personal and richer feedback experience to students and audio use was found to increase the level of interaction and dialogue amongst students and between students and lecturers. Audio was found to encourage wider and deeper self-reflection in students, and was shown to improve learners' communication skills.

However, the impact of audio to support student self-assessment was not clearly identified from the findings of the study. It was reported that most

students found the process of self-assessment difficult and audio did not make this any easier.

2.6 Web 2.0 and Wikis

The term Web 2.0 term was developed in 2004 by Dale Dougherty of O' Reilly company (O' Reilly, 2005a). The name Wiki is based on a Hawaiian term "*Wiki*" which means "*to hasten*", or "*quick*". A Wiki has no fixed structure and is defined by users, group dynamics and the establishment of social rules and norms (Doolan, 2010a). Shifting the balance of control over the structure and content to the learner, it has been suggested, changes the dynamics of online learning and collaboration (Elgort et al, 2008) and places "*the emphasis on a self-directed approach*" thus "*enabling learner-learner communities* (Doolan, 2007) cited in Mathers and Leigh (2008:1). However, McFarlane (2009) found it necessary to use a Wiki guide designed by Doolan, (2007) whilst implementing a Wiki to support learners engaged on the Postgraduate Certification in Higher and Professional Education course at Staffordshire University during 2009. It has been argued that the dynamic nature of a Wiki means accessibility to the technology from anyplace, at any time through various traditional and mobile technologies (Doolan, 2009; Stewart and Doolan, 2009; Doolan and Simpson, 2010). Hence, a Wiki in addition to a Podcast (see section 2.5) supports learners with choosing when and where they want to learn (Chan and Lee, 2005).

The Wiki exchange is asynchronous; all communications and edits are recorded, providing learners with an opportunity to collaboratively build, develop and exchange knowledge online that can impact on knowledge management and can support knowledge creation and sharing (Leuf and Cunningham, 2001, Breton et al, 2003; Lamb, 2004; Richardson, 2006; Doolan, 2006;2007a; 2007b; 2007c; 2008; 2009; 2010a; 2000b).

Wikis can support learners with collaborative writing and with the development of collaborative skills (Godwin-Jones, 2003; Wang and Turner, 2004). Wiki as a collaborative learning tool has been shown to enable learners to acquire necessary skills for the workplace (Doolan et al, 2006).

Personalised learning has been supported by a Wiki (Doolan, 2006; 2007a; 2007b; 2007c; 2008; 2009; 2010a). In these works it was argued that personalisation of learning provides learners with the opportunity to use a Wiki to create their own dynamic learning environment; one that is progressively evolving and changing as used by its authors and is thus organic in nature. In these works it has been shown that a Wiki supports the embedding of other technologies such as mp3 files through attachments and hyperlinks within and external to the Wiki site. A Wiki supports social, collaborative and community-building aspects of learning, providing the freedom and opportunities for individuals to work in groups, socialise and collaborate (Brereton, et al, 2003; Doolan 2007a; 2007b; 2007c; Doolan, 2009; 2010a).

It has been shown by Syneta (2002), Honegger (2005) and Doolan (2006; 2007a; 2007b; 2007c; 2008; 2009; 2010a) that both teachers and learners are co-producers of content. Learners develop their own learning content in a participatory environment that enables the formation of a community of practice (Boulos, Maramba and Wheeler, 2006) and a community of learning (Doolan, 2006). In this way, the focus is on community learning rather than on the individual learner (Wenger, 1998; Holmes, Tangney, FitzGibbon, Savage, & Mehan, 2004).

To this end, the sharing of content enables a shared repertoire (Wenger, 1998) and a repository of knowledge to be developed. The Wiki repertoire comprises ideas and a knowledge base that is progressively evolving and growing over time (Godwin-Jones, 2003; Doolan, 2006), where the goal is to develop shared solutions to problems (Godwin-Jones, 2003). It is argued by Godwin-Jones (2003), Wang and Turner (2004) that learners using Wikis in this way develop negotiation skills and understandings.

The idea of mutual negotiations relating to a community of practice is supported by Wenger (1998). Support for Wiki use in education tends to have a definite purpose and use of a Wiki is structured rather than left unstructured for personal learner use (Schwartz et al, 2004). Doolan (2008; 2009) structured a Wiki that comprised communal and group working spaces for learner use. This use resulted in a mutually agreed and shared repertoire inter and intra groups including working practices, ground rules, documents, images, video, and audio to support group-based assessment.

However, Wikis are simply a tool that will only be used if it has a purpose, such as if it is a component of a larger suite of educational tools to promote participation and collaboration amongst students (Judd et al, 2010). It is important to focus on the pedagogy that for the most part has been found to be a redesign of already good teaching and learning practice (Doolan, 2006).

There is an argument in education over the scholarly nature of Wiki content although a survey found that Wikipedia (<http://Wikipedia.org>, a user generated encyclopaedia) was at least as accurate as the Encyclopaedia Britannia (Terdiman, 2006). This work also shows that some pages have now been locked and or moderated. Lamb (2004) argues that concerns relating to the destruction of Wiki content are unfounded as the open nature of the Wiki encourages a common purpose through community participation. Additionally Doolan (2006) argues that since Wikis make visible the changes made by authors and the version control feature allows pages to be rolled back to previous versions this prevents the permanent deletion or tampering with Wiki content. Wheeler (2006) found when using a Wiki to support class based learning that the unstructured nature of the Wiki pages was found to be problematic by some learners. In contrast to this Doolan (2006) found that the unstructured nature of Wiki pages provided a dynamic learning environment where learners took ownership of and co-designed their own learning spaces which they negotiated and agreed collaboratively to meet the group learning needs whilst undertaking group-based assessment.

According to Lamb (2004) pedagogical practices need to evolve where the teacher relinquishes some control over learning activities. This sees a shift in

emphasis from the tutor to the learner where the tutor acts as a facilitator of learning. The tutor as a facilitator manages the learning and teaching process online. This is a common approach when using technology in online community learning (Palloff and Pratt, 1999; McConnell 1994; McConnell et al, 2004; Squire and Johnson, 2000). To this end, online community learning is critiqued in the next section and relates to the key research themes in this study **collaborative learning** and **technology**.

2.7 Computer supported collaborative learning

Online community theory also known as 'networked' (Goodyear et al. 2000) and 'virtual community' (Palloff and Pratt, 1999) uses networked technology to collaborate, interact and engage, especially the Internet. Goodyear et al (2000: 18) define 'networked learning' as *"learning in which information and communications technology (ICT) is used to promote connections: between one learner and other learners, between learners and tutors; between a learning community and its learning resources"*.

Virtual communities are formed around issues of identity and shared values and are not location based as in a 'physical' space; rather they use technology as the shared space (Palloff and Pratt, 1999). Therefore, it is argued that networked and virtual learning takes place within a learning community and are bounded not by a physical space but by the 'community' and the connections and interactions between all participants engaged in the learning community. In contrast to the 'physical place' based community,

virtual communities are fluid, which means they have no formal boundaries. In this context, norms do not dominate as much as in the 'traditional' physical place based community.

What is common to both is the concept of connectivity, participation, collaborations and engagement between those parties within the community whether place based or online (Bruner, 1996; Vygostky, 1978; Wenger, 1998). The basic underlying concept is collaboration (Dillenbourgh, 1999). Squire and Johnson (2000) posit that virtual communities are formed around an activity and as a need arises, where language, practices, customs and resources emerge over time as the community develops (Lave and Wenger, 1991; Wenger, 1998 Paloff and Pratt, 1999; Tu, 2004; Mc Connell, 2004).

It is argued some of the richest *interactions* “*involve online materials and with other people*” (Goodyear et al, 2000: 18). However, Goodyear et al (2000) further suggest that networked learning is not defined by the learning resources used; rather what defines it are the human-human interactions such as computer mediated communication which sees humans interacting with a computer and a computer interacting with a human (Preece, 2001; Mc Connell, 2004).

The argument is made that interactions involving humans in this way are a key essential component to promote engagement in networked learning when used as part of a campus-based pedagogical practice. This is supported by sociocultural development theories (Wenger, 1998; Vygotsky, 1978, Dillengourgh, 1999) where interaction and participation are a central

tenet in social and situated contexts (Lave and Wenger, 1991). The community concept (Wenger, 1998) and community online (Preece, 2001, Palloff and Pratt, 1999; Tu, 2004; Mc Connell, 2004. Preece (2001) describes how interactions and engagements within an online community can create a sense of warmth, belonging, and an opportunity for people to chat and help each other.

This is supported by community of practice theory (Wenger, 1998). Preece (2001) goes on to describe the setting for the online community as one where learners have a common interest, a need to exchange information with a shared purpose for being a part of the online community. This is supported by community of practice and group and collaborative theories (Wenger, 1978; Lewin, 1951; Dillenbourgh, 1999). Over time learners arrange protocols for engagement in the online community in the form of protocols or rules and norms of behaviour in order to support each other whilst interacting in the online community. Beliefs and value development over time is supported by community of practice theory (Wenger, 1998).

Palloff and Pratt (2005:8) define the elements of an online community as *“people: the students, faculty, and staff involved in an online course”*. They further explain how the online community relates to the coming together of people for a shared propose, such as engagement in an online course which requires information and resources to be shared amongst people. Both Preece (2001) and Palloff and Pratt (2005) offer ways to support learners whilst engaged in an online community. They suggest the need for guidelines to help create structure within the community environment and the

importance of providing ground rules for interaction and participation. This is supported by learning theories (Biggs, 1997; 1998; 1999; 2003; Laurillard, 1999). Whilst referring to technology Palloff and Pratt (2005:8) define this as a *“the vehicle for delivery of the course and a place where everyone involved can meet”*. When referring to collaborative learning they describe this as *“student-to-student interaction that also supports socially constructed meaning and creation of knowledge”* (ibid: 8). This view is supported by a whole body of literature (see, for example, Vygotsky, 1978; Lave and Wenger, 1991; Wenger, 1998; Wenger, McDermott and Synder, 2002).

McConnell's (2004) study of online community is built on social constructivism (Vygotsky, 1978) relating to distance online learning. McConnell's work suggests a move towards a paradigm of collaboration in response to the challenges posed by both the technology and the drive towards a mass education culture. This paradigm is made up of collaboration and co-operation dialogue and group work together with interaction with online materials and collaborative knowledge production. This is supported by Dillenbourgh's (1999) concept of collaboration, Lewis's (1951) view on group learning and Vygotsky's (1978) stance on social knowledge construction.

To help support group work online Nunamaker (1991), Doolan et al (2006) and Doolan (2007c; 2008; 2009; 2010a) recommend that learners are provided with a guide, some type of structure for the learning activity online in the form of procedures, for example, by creating templates, and establishing deadlines, or by encouraging the group to adopt an agenda.

What is different between face-to-face and online learning is that the latter uses networked technology to collaborate, interact and engage, especially the Internet. For instance Wikis can be used to support collaborative learning with the focus being on community knowledge rather than the individual learner where teachers and learners collectively create knowledge for the good of all (Leuf and Cunningham, 2001; Holmes et al, 2004; Doolan, 2006). In this thesis a Wiki is used to support groups undertaking group-based assessment. Thus the conceptual framework in this study is used to support social learning through participation and engagement within and across groups. Learning in this way is supported by technology in a blended learning framework. Through participation and reciprocity knowledge is developed amongst learners.

2.8 The conceptual framework of this thesis

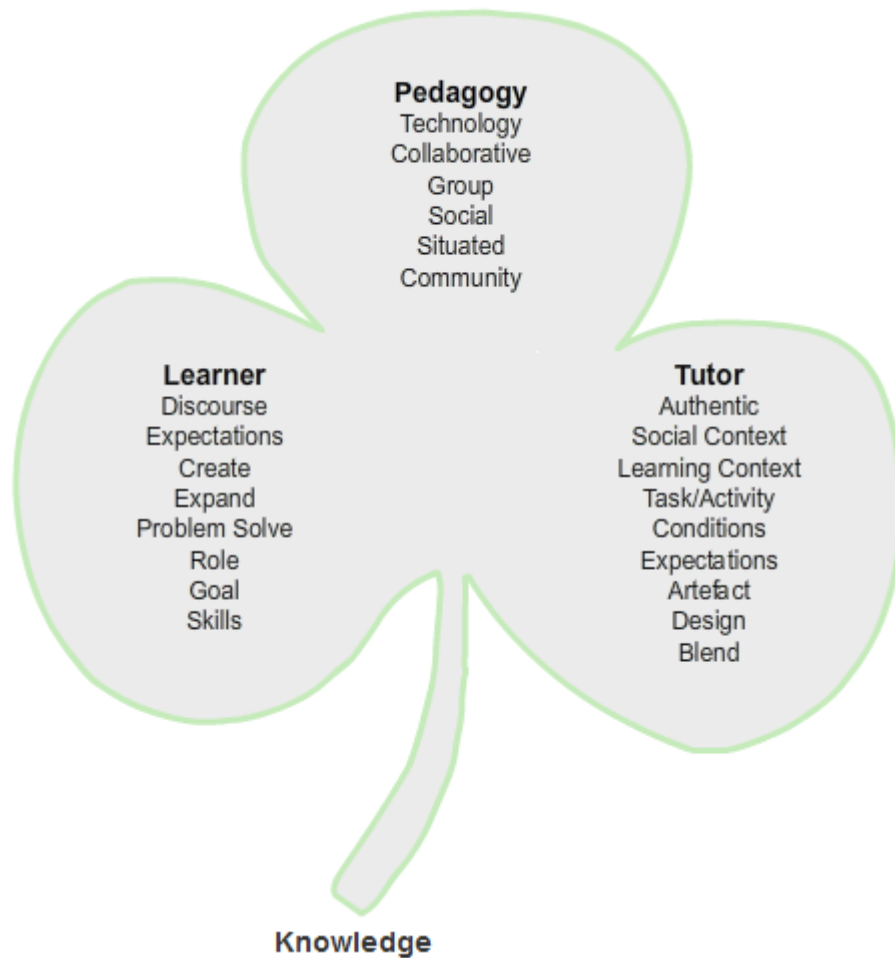


Figure 2.3: The conceptual framework

Figure 2.3 provides an illustration of the conceptual framework based on the scholarly works presented in this chapter that underpin the research in this thesis. The shamrock in Figure 2.3 shows three leaves bearing the three concepts: Pedagogy, Learner and Tutor and related to the three key research themes **tutor**, **technology** and **collaborative learning** to answer the research question.

The Pedagogy in the conceptual framework in Figure 2.3 encompasses a learning environment that comprises collaborative (Dillenbourgh, 1999), group (Lewin, 1951), social (Vygostky, 1978), situated (Lave and Wenger, 1991), community (Wenger, 1998) learning and technology. The **technology** is used to supplement, not replace, class based learning; thus learning is in a blended mode. The interaction of the technology with the various learning theories posited is explored in the analysis of this thesis.

The Learner in the model engages in learning through discourse initially comprising joint negotiations and shared expectations with other learners in order to complete the assessed learning activities. In this way, the learning activities are set by the tutor to promote interaction and participation with pedagogy, learners and tutor (see section 3.4.2 in Chapter 3). The intention of this design is to promote opportunities for learners to create and expand their knowledge whilst problem solving collaboratively. The learning design comprises authentic learning activities through mutual engagement with the activities using role-play whilst learners are situated in groups in a social learning context. Learners work together on shared learning goals which are work related to enhance skills development such as team building, and working and relating to others whilst developing community knowledge. This is related to the key research theme **collaborative learning** to answer the research question.

The Tutor domain represented in the conceptual framework views the **tutor** as one who initially designs the conditions for learning and evolves based on learner participations and interactions. In this thesis authentic learning

activities (Gupta, 2004) are designed in a social and situated learning context (Vygotsky, 1978; Lave and Wenger, 1991) where tasks and activities are designed by the tutor to promote interaction, participation and sharing amongst learners (Wenger, 1998). Both the tutor and learners set clear expectations for learning (Chickering and Gamson, 1987) which create the conditions for deep learning (Biggs, 2003). Learning in this way promotes a sense of belonging to a community to promote participation and mutual engagement in learning (Wenger, 1998). In this way reciprocity is between the tutor, learner and the Pedagogy in a collaborative blended learning context (Doolan, 2006; 2007a; 2007b; 2007c; 2008; 2009; 2010a). This context comprises shared learning in and out of class through the development of a repertoire of shared and mutually agreed artefacts between learners and tutor, such as co-produced and co-authored documents and media such as audio and video.

The context is intended to provide a learning resource for learners that is progressively and continually added to and reviewed with peers and tutors as learning progresses. In this way, the learning repository is fed forward for use in learning designs for subsequent years. Hence, learners are perceived as a valuable resource as co-producers of content (McCulloch, 2009). It is argued that though participation, reciprocity and mutual engagements whilst engaged in an active learning experience (Race, 1994), knowledge is developed. Indeed in this thesis it is argued that the proximal zone between the learner, tutor and technology leads to the zone of proximal development (Vygotsky, 1978). Furthermore, the argument is made that for learning to

occur learners need to feel a sense of belonging, of being situated in a context such as a community (Wenger, 1998; Paloff and Pratt, 1999; Goodyear et al, 2004; Tu, 2004; Mc Connell, 2006; Doolan, 2007a).

2.9 Conclusion

This chapter has provided the theoretical framework relating to the conceptual domains necessary to ground this research study. Community, collaboration, the learner as participant or partner in group learning and social constructs further our understanding of collaborative learning as applied to this thesis by characterising learner behaviour and learning itself as a process, a state and a change in behaviour. In collaborative contexts it has been shown that this occurs by observing or mimicking others, and by participating and engaging with others. The learning models, frameworks and principles provided in this chapter demonstrate that, whether or not learning occurs collaboratively, the actual process of learning involves cognition such as changes in thinking. This is something that is individual to every learner. However, the teacher has a role to play in designing for learning that is authentic, situated in context and social in nature.

What is shared between the concepts and theories discussed in this chapter and specifically related to my research is the agreement amongst the references cited that learning resides with the learner, not the teacher and that learning is promoted by active learning and situated in a social context such as collaborative and community learning environments which may

include and be supported by the use of social media such as Wiki, Blogs and Podcasts.

The following chapter describes the design and development of the blend of class and Wiki technology for the work conducted to develop this thesis. It is argued that there is a clear role for the tutor whilst setting up the blended learning design and that, when used in this way; a Wiki is a learning resource.

Chapter 3 The design and implementation of a learning blend

“Good programmes like good teachers are designed to listen and learn from students as part of the process of instructing them” (Ramsden 1992:160).

This chapter is intended to clarify the role of the tutor in enabling student learning through the use of a blend comprising a Wiki application to supplement class-based learning. Such clarification will firstly establish that there is a clear role for the tutor in establishing a Wiki learning environment to support collaborative learning through assessment. The argument is made that a Wiki when used in this way is a learning resource to support collaborative learning.

This is achieved through the discussion based around the three leaves of the shamrock of the conceptual framework in Figure 2.3 in Chapter 2 and aligns with the three key research themes: **tutor**, **technology** and **collaborative learning** presented in 0.

The intention is to share the pedagogical practice that includes designing the conditions to prepare learners for collaborative learning using the Wiki. Furthermore, the intention is to share the supplemented class based practice to prepare learners to work collaboratively using the Wiki. The learning design is considered through existing pedagogical theories and concepts based around the conceptual framework in Chapter 2. This redesign of

pedagogy culminates from over 5 years of work which has taken place to develop understanding of the pedagogical redesigns necessary when using a Wiki technology with students in collaborative and community learning as part of a blended learning framework (Doolan2006; 2007a; 2007b; 2007c; 2008; 2009; 2010) (see Appendix C for publications relating to this thesis).

The three leaves of the shamrock of the conceptual framework in Figure 2.3 are presented to include the role of the tutor in setting up and providing the learning environment which is deeply rooted in the pedagogical theories discussed in Chapter 2 and the learner experience. These are substantiated by providing an overview of the module, the participant data and a description of the impact on the learner of the preparatory activities intended to prepare learners for the collaborative and the Wiki experience and presented in the following section.

3.1 The module Overview

The Information Systems Development course under study is delivered through the use of information systems case studies. The assessment was designed by the tutor to provide learners with an innovative way, best suited to the learning process and outcomes. With this in mind, learners were directed to work collaboratively in groups of six to complete assessed learning activities supported by technology whilst studying on the Information Systems Development module. The activities were designed to encourage active learning by doing (Race, 2001) and to support learners to actively

practice and make sense of the course material administered during the course and are described in section 3.4.2.

3.2 Learners

Learners in this research may be perceived as the 'net generation' (Oblinger, 2005) given in Table 1.1. 91% of learners were born in the late 1980s, between the mid-1970s and 2000s. As shown in the population data for study 1 and 2 of this research in Table 3.1 and Table 3.2 respectively, sixty three percent (29) were less than 21 years old and 37.2% were greater than 21 between the ages of 21 and 25 out of a total of 80 respondents. The majority, 61 learners out of 80 learners (76.25%), had Internet access from their term-time accommodation. As shown in Table 3.1, only one of the learners who participated in this study was over forty years of age. Ninety one percent of learners in this research are under the age of 21 years and report a high confidence level in the use of technology with high levels of access to the Internet from their home off-campus. Study 1 and 2 are described in sections 5.4 and 5.5 respectively.

AGE		GENDER	
Under 21 21[47.7%]	21 to 25 23* [52.3%]	Male 9 [20.4%]	Female 35 [79.6%]
STUDY TYPE		BACKGROUND	
Full Time 43 [97.7%]	Part Time 1 [2.3%]	Direct Entrance 11(8**)/44 [25%]	AS/A 30/44 [68.2%]
IT BACKGROUND			
Have Internet access from term-time accommodation		33/44 [75%]	
Confident about use of e-technology		40/44 [90.9%]	

Total respondents: 44 [73.3%]

Table 3.1: Background information on the respondents in study 1: 2005-2006

AGE		GENDER		
Under 21 49 [61.25%]	21 to 25 29 [36.25%]	Male 17 [21.25%]	Female 58 [72.5%]	
STUDY TYPE		NATIONALITY		
Full Time 78 [97.5%]	Part Time 0 [0%]	Home 75 [93.75%]	EU 2 [2.5%]	Overseas 2 [2.5%]
IT RESOURCES				
Have Internet access from term-time accommodation			Y = 61 [76.25%] : N = 18 [22.5%]	

Total respondents: 80 [83.3%]

Table 3.2: Background information of the respondents in study 2: 2006-2007

* One student was older than 40. **Previously studied a foundation year in a further education college. Some respondents failed to respond to gender and nationality.

Thus the cohort of students is comprised of learners who have grown up with the use of technology in learning and their everyday lives.

3.3 The role of the tutor

Pedagogy in this study is defined as the “*relationship* between teaching and learning and how together they lead to growth in knowledge and understanding through *meaningful* practice (Loughran, 2006:2 italics added).

3.3.1 Preparing the learner

This section presents the preparatory activities that were designed by the tutor with the intention of supporting the learners’ collaborative experience.

The primary motivation was to ensure learners were prepared for the collaborative learning experience. Interweaved in the descriptive in creating the conditions to support the collaborative learning experience are the intended consequences arising from the tutor role. These consequences were captured through tutor observations and justified in Chapter 4. To this end, learners were prepared for the Wiki learning experience in two ways: in class -based sessions and using the discussion facilities of the University’s MLE.

3.3.2 Discussion facilities

From the beginning of the Information Systems Development module the discussion facilities embedded in the University’s MLE were used by both the tutor and learners to extend the class based dialogue and to promote an ethos of collaborative/community learning environment. Initially the use of the

discussion facilities was facilitated by the tutor twice weekly on a Monday and a Wednesday. Monday was chosen to give learners time to reflect on work undertaken in the classes that took place on a Thursday; Wednesday was chosen so that concepts could be taken forward into the classes on Thursday. In this way any misconceptions arising in the discussions could be clarified. However, as learners gained in confidence and it was evident to the tutor they were responding regularly to peers, the tutor commitment lessened. This said, during the assessment period the tutor facilitated the discussion facilities once again on a twice-weekly basis as before and more regularly nearing the submission deadline. The time resource was limited given, overall, the learners themselves responded to postings. In general the postings made by learners around the assessment deadline were targeted at group members for housekeeping, such as to look at the Wiki for the latest update on activity undertaken.

In this way, the tutor observed how the questions asked in class were made visible to others. Learners practiced and consolidated the concepts introduced. Using the discussion facilities in this way afforded the tutor the opportunity to reaffirm the learning outcomes in a safe learning environment. This reduced the tutor time spent with individual questions as the assessment progressed. It was clear to see that the students' confidence levels were increased by providing a safe and sheltered environment within a class based setting to air any misconceptions. In this way, the ethos of collaboration was promoted.

From the outset of the module, using the discussion forum in this way was intended to help learners with the transition to the Wiki learning environment for the assessment. It was important to this study that the face-to-face approach with the online learning approach was carefully designed into the module as this was intended to maximise the learning opportunities provided by each approach (Doolan, 2006). This was supported by the tutor and presented in the following subsections.

3.3.3 Introductory face-to-face sessions

The introductory face-to-face sessions were set up by the tutor with the intention of ensuring that learners were adequately briefed and understood the requirements of the learning activities; the lecture room was the most appropriate setting for introducing the online Wiki environment through a live demonstration. In this way it was intended to address the cohort of learners and respond to feedback from learners and to address any potential problems. Following on from the introductory lecture, a tutorial/seminar was used to take learners onto the next preparatory stage. Both the lecture and tutorials created a student-teacher interaction experience as the tutor approach is student centric and predominately interactive.

In a lecture and through other mediums, the tutor constantly sought feedback on using the discussion facilities and class-based practice to feed forward into online and class-based practice. For example at the beginning of a lecture learners were prompted by the tutor to write one good thing and one

not so good thing about practice thus far. The tutor provided a *feedback box* for learners to post comments, compliments and concerns on any aspect of practice as they left the lecture room. This practice was continuous and on-going from the beginning of the module.

The tutor observed the impact on the learners. Firstly, learners' provided valuable comment/feedback on the use of the online discussion forum. Secondly, the majority of learners requested additional online learning activities and for these to be facilitated. Thirdly, learners requested that the tutor oversee the discussion forum on Friday and Tuesday. Learners chose Friday as it was the day after the lecture and Tuesday because, learners said, they engaged in study over the weekend. Fourthly, such feedback continued a dialogue between all parties where the tutor was seen as responsive and supportive. Learners have reflected on this practice *"Having set days when we know that you are going to be looking at and answering our questions really helps and means that we can be sure of resolving our problems"*(S8). Fifthly, learners constantly demonstrated their active engagement with the discussion facilities by reading and responding to others postings and trying out the activities posted online. Sixthly, learners tried out the learning activities in offline settings, i.e. at home and using the module textbook. By obtaining this informal feedback in a continuous evaluative way the tutor is in a position to respond in time to learners thus promoting dialogue between learner and tutor and tutor and learner in Laurillard's (2001) conversational framework. Seventhly, this continues the

ethos of collaborative/community learning necessary to promote social learning.

3.3.4 Introducing group members in class

To help support group dynamics (Lewin, 1951) and a sense of belonging (Wenger, 1998) in this study the tutor scheduled time into the learning plan to introduce group members prior to the collaborative experience. This introduction was over a one-week period and took place in two lectures and two tutorials. In this way, the time period was able to include all learners. The tutor used a class list to derive the groups and used this group list during the group-based sessions in the lectures and tutorials. Individual group members were introduced to their group of six and encouraged to get to know each other. In this way, it was intended to help the group to socialise, build a group dynamic and increase their understanding of the complexities of communicating and interacting online. This was supported by activities in the tutorials as set out in section 3.3.5. Learners discussed the pros and cons of online communications and interactions. Introducing group members in this way the tutor observed the following consequences:

1. Learners got to know each other before going online.
2. Learners built a rapport; there was evidence of joke-making and working on task.
3. Two learners requested to change group due to cultural differences amongst the group members.

4. The tutor could follow up by email on any members missing from class and make the introduction to the group.
5. This helped build a rapport between learners and with the tutor.
6. Reaffirmed the community/collaborative ethos for learners and tutor.

3.3.5 Varying tutorial activities

Learners were prepared for the Wiki experience during tutorials. A tutorial group consisted of thirty learners although generally activities during tutorials were conducted in groups of (usually) six members. This was to help learners to develop group-work skills and to develop an ethos of collaborative working and learning. On a weekly basis, where possible, students worked in different groups to reinforce topics introduced in lectures and to help learners reaffirm concepts and, in addition, to help learners further their development of group skills such as working and relating to different people in order to enhance learners' communication skills. The group activities were set to promote active engagement and activities were set to promote the sharing of different knowledge and understanding of material. The material was generally delivered in lectures that were directly followed by the tutorials. There were two tutorial groups, given the cohort of learners. Learners were allocated to a tutorial group using a class list. The tutorials promoted the concept of learning in groups. The class-based activities set by the tutor included simulated on-line activities, providing hints, tips, prompts, comments, explanations and preparation for the individual and group online assessed activities and tasks. Because of the nature of the

subject and the need for a critical understanding of concepts and methods delivered during the lectures, learning activities set in tutorials were often practical. Demonstrating a level of ability in analysis and evaluation whilst demonstrating an ability to work and relate to others in a team environment was crucial for learners studying the Information Systems Development course and experiential learning approaches provided links with industry.

3.3.6 Simulated interactive exercise

Learners were supported with the transition from face-to-face into the Wiki collaborative environment through a simulated interactive exercise that took place in a tutorial. This involved providing the learners with a group based problem to solve, using a large piece of white paper to replicate an online Wiki page, some post-it notes, a pen and instructions not to talk as they complete the task. Doolan (2007b) showed how this approach provided a simulation of an online asynchronous environment that supported learners in the transition to a Wiki environment. Learners wrote on the post-it notes and attached these to the white paper, thus simulating contributing to the Wiki. During the activity, the tutor observed how learners engaged with each other and gained in understanding of how learners negotiated their meanings. It was clear that learners came to a consensus and agreed how best to complete the task. The learners made problem-solving skills visible to the tutor.

Following the simulated interactive exercise, the learners were encouraged to talk and discuss the advantages and disadvantages of working in an online environment. The tutor observed how learners articulated their need to provide clarity whilst online. Learners realised the importance of planning for online engagement. Learners articulated the need to share information within the group and identified the importance of team working and the need to communicate effectively within the team in order to achieve. These were important observations for the tutor as it was clear learners demonstrated that they were making the connection between the syllabus for learning and their collaborative assessment.

Learners additionally showed that they understood the importance of team working as a life skill. It is important for learning that learners make this connection and see a purpose for engagement in learning (Canole, 2002). This was also important to promote group dynamics (Lewin, 1954), the formation of relationships (Wenger, 1998), for mutual engagement (Wenger, 1998) and the need for interdependence (Lewin, 1954) between individuals to complete tasks. Overall, to promote learning, it was important for learners to view their place in the overall success of the group and cohort.

3.3.7 Instructions - online based documentation

Learners were provided with instructions both on paper and on the Wiki pages. In this way the learners had a reference with permanent access as learners completed the assessment. This was important to provide an

opportunity for learners to add the learning materials to their private group space and for this to be made simple by creating links within the online learning environment. In this way this was intended to provide a facility for adding annotations and other content to the learning materials as learners progressed through the learning activities. This was also intended to provide a learning resource for learners to continually review their own and peers progress and feed forward for use in learning designs for subsequent years. This was important to the tutor as learners are perceived as a valuable resource as co-producers (McCulloch, 2009).

3.3.8 Familiarising learners with the Wiki tools

Time was set aside by the tutor to put the learners into groups and to ensure that they had time to become familiar with the Wiki tools before they completed the learning activities. This created an opportunity for learners to engage in the redevelopment and upkeep of the Wiki learning environment as learners were asked to set up a group and act as consultants to the tutor, given their knowledge of social technologies and background in computers as presented in the respondents' background information in Table 3.1 and Table 3.2 in Chapter 3. The tutor observed how learners continuously added their technical expertise to the development and management of the Wiki. This allowed the tutor to then step back, after the assessment and the supplementary learning materials had been distributed to learners and the collaborative learning experience was underway.

The face-to-face introductory session, under the guidance of the tutor, was not only intended to introduce the Wiki learning environment but also to help learners understand the assessment requirements of the five associated learning activities described below. In this way, the tutor carefully prepared learners for the online collaborative experience. To this end, the tutor's role was front-loaded in terms of committing time upfront to the development of the learning design. The next section addresses the key issue relating to the design of the assessment.

3.4 The assessment design

The assessment design was 'constructively aligned' (Biggs, 2003) with the teaching and module learning outcomes. Learning by doing (Race, 1994) was promoted through authentic (Gupta, 2004) learning activities that were purposeful (Canole, 2002). The learning activities were designed to be shared between groups and within groups using the Wiki (Doolan et al, 2006) and influenced by the community (Wenger, 1998), collaborative (Dillenbrough 1991), social (Vygotsky, 1978) and situated (Lave and Wenger, 1991) theories. The assessment specification is in Appendix B.

3.4.1 The blend in assessment delivery

The core learning task (activity 2 in section 3.4.2.2) was provided by the tutor in the following formats: video, podcast and script and these were made available in the communal area in the Wiki in addition to an overview

delivered in a lecture. The core task was chosen by the tutor for recording and other tasks built upon this.

3.4.2 Learning activities

The five learning activities described below were designed with an emphasis on 'learning by doing' (Race, 1994) to actively engage and stimulate learners to participate in their learning in a collaborative context (Dillenbough, 1999). With this in mind, the learning activities were designed to specifically stimulate learners to actively practice collaborative working and make sense of the course material administered during the course. To encourage learners to adopt a deep approach to learning (Biggs 2003) the learning activities were designed so that learners would gain an in-depth knowledge of the subject matter. The activities required learners to solve problems where each problem built upon the previous one. There was a mix of activities that comprised one individual and three group-based learning activities, designed to promote ownership and participation within groups and between groups. Individual tasks comprised the group commitment (activity 1 in section 3.4.2.1) and the individual reflective Blog (activity 5 in section 3.4.2.5).

Each activity is described with the rationale for the design in the following section. Tasks were designed to relate to one another and for learners to share within and between groups. In this way it was intended to help build a group dynamic (Lewin, 1951), promote mutual engagement (Wenger, 1998)

and a sense of belonging to a collaborative/community learning environment (Wenger, 1998; McConnell, 2004). In this way, the learning activities were designed to initiate learner curiosity and set the learners on the path to discovery.

To create effective learning together, the problem was designed to be plausible (Canole, 2002), each group member had a structured job to do, the tasks were divisible by the number of group members, and the tasks were interdependent (Doolan et al, 2006). In so doing, the intention was to motivate individuals within groups to support their group in the achievement of tasks.

The assessment design was intended to initially create the seeds for the Wiki learning environment and as a foundation for it to grow. Hence the tutor approach adopted for the up-front planning and design of the assessment was to nurture a collaborative/community learning experience (Doolan, 2006, 2007a). This organic view of the learning environment is provided in 0.

Learners were provided with a case study (see 7.9Appendix A) and expected to carry out the following:

3.4.2.1 Activity 1 (Individual) – Group commitment

The group commitment activity was set by the tutor as an individual task and was expected to be submitted by each individual group member to the 'private' group space in the Wiki. Activity 1 was designed to obtain personal 'buy in' to the group work to complete the set tasks. It was also intended to

support the development of a group dynamic between individual group members. With this in mind, activity 1 is a group commitment task. It was also intended through this task that, in keeping account of their contribution to the collaborative experience, they would 'buy in' to the group activities and 'commit' to 'equal' participation in the collaborative experience.

The task requested them to submit their individual name and the names of other group members, e.g. I am Fred Bloggs and I am working with John Smith, Mary O' Reilly and Peter O' Connor. I am Peter O' Connor and I am working with Fred Bloggs, Mary O' Reilly and John Smith etc. This group statement was necessary to confirm that learners had a list of group contact details (names, telephone numbers, email addresses). The 'ground rules' used by the group in order to be able to operate successfully were also set in the group commitment statement, in terms of the role and responsibilities agreed within the groups. In addition organised group meetings were expected to be documented and included in the final assessed report in the following format: dates and times of planned meetings, apologies for absence, minutes of last meeting, motions (list of matters discussed), actions identified at meetings including individual group member name(s) showing the person(s) responsible for carrying out these actions. Each individual student was responsible for signing and agreeing to these at every meeting. The signed copies were expected to be included in the group assessed report. Each individual student was responsible for demonstrating in their individual reflective log (see Activity 5) how they had met their agreed group

commitment. This was validated by the tutor against the signed copies of meetings.

3.4.2.2 Activity 2 (Group) - Identify needs and establish requirements

In the second task the core activity was designed so that other group tasks were built upon this. The core activity was recorded on audio (podcast) and video (Jumpcut) and linked to Wiki contributions by the tutor as discussed in section 3.5.1 The methods were delivered in a lecture and reinforced by practice in a tutorial. The learners were required to agree a method and to inform the tutor by means of the discussion forum on the University MLE. This communication was; firstly, to ensure learners had the resources; secondly, to find out if the learners needed support; thirdly, to find out if the technology chosen was compatible with the Wiki; fourthly, to ensure group agreement. The instructions were as follows:

1. Choose a method: interviewing, direct observation, brainstorming or another method of your choice. Agree this on the Discussion forum on the MLE by a set date. (Students were expected to state the technology they intended to use to carry out the task and whether or not they had the resources to undertake the task)
2. Record using one or more of the following: video, webcam, audio, podcast, document in Wiki or capture ideas using the discussion forum, *or* another method of your choice.
3. Add the results/product in Wiki, show, and share work and gain feedback from “a set of potential users”. (Learners were required to

submit their product in the communal area in Wiki and gain feedback from another group).

4. Use feedback obtained from the group to complete the 'Requirements Document Template' provided to document the requirements.

Steps 2 and 3 provided a simulation of the real world and were thus designed based on the concept of authentic learning (Gupta, 2004). This was intended to help learners to prepare for the work place. Therefore step 2 involved data gathering activity intended to capture the requirements for a computer system. Step 3 was designed to seek out another group, 'a set of potential users', to listen to the recording/read the script of the requirements captured during step 2 and to evaluate the findings. In this way, it was intended learners would be practiced in evaluation methods and in requirements capture both valuable to complete the assessment and in industry. The outcomes of steps 2 and 3 culminated in step 4 - the requirements document. This was expected to be included in the final assessed report.

3.4.2.3 Activity 3 (Group) - Develop storyboard and design

Learners were expected to ensure that the tasks were clearly visible in their Wiki in their private group area designed by the tutor and described later in the chapter. Activity 3 was intended to be shared between the different group

members in keeping with the collaborative/community aspect of the pedagogical design.

1. Produce a storyboard based on identified requirements and user needs.
2. Show it to a set of potential users [using the roles provided on the “Roles” handout role-play within your student group in the Wiki and obtain some informal feedback.
3. Sketch out the application’s main screen (home page). Consider the screen layout, use of colour, navigation, audio, animation, etc. While doing this, consider: Where am I? What’s here? Where can I go? Write one or two sentences explaining each of your choices, how these choices will affect the users, in particular Diresh, *who has no experience in using computers: in fact he is terrified of using computers*, and consider whether the choice is a usability consideration or a user experience consideration.”

This learning activity was designed to build upon activity 2 (the core task) and to provide learners with a means to demonstrate and show their understanding of the concepts delivered in a lecture, reinforced through practice in tutorial sessions. The role-play was intended as a simulation of the workplace and based on authentic roles within the workplace. Step 3 was an opportunity for learners to demonstrate their practical understanding of the human interaction concepts introduced and practiced in classes. Within the group, the students were required to come to a consensus and agree roles between them from the description of roles provided for the

development team and the client/end user group (see Appendix B.ii). When playing the role of developer, each member of the group was asked to agree to play one role from the following: Business Analyst, Systems Analyst, Project Manager and HCI Specialist. The descriptions were designed to help the students to have an understanding of the different roles of a typical software development team and the importance of each role to the development project. When acting as the client/end user, each member of the group was asked to agree one role from the following: Owner, Managing Director, Secretary and Accountant. The descriptions were designed to develop an understanding of the varying needs of different users when developing a computer system and the importance of capturing clear requirements. Therefore, learners gained experience in playing two roles as each learner within a group played one role as a 'developer' and one role as the 'client'. In this way, it was intended learners would gain practical experience necessary for the workplace.

When playing the role of developer the students were required to carry out one interview, brainstorm, observation or textual script. As the development team, the students were required to develop common questions to ask the end user, group questions tailored to each individual user in the group in order to gain an insight into the way the business currently operates and possible future requirements. To help the students with this task, two lectures were delivered to students on requirement gathering techniques such as interviewing, observation, and brainstorming. The requirement gathering techniques were also practiced in tutorials whilst learners were in groups. It

was not felt necessary to train students in the use of audio and video equipment given learners' postings on their technological preferences on the discussion forum. No students requested institutional resources. It was apparent that learners had decided to use their own equipment to undertake the task as described in Chapter 6.

3.4.2.4 Activity 4 (Group) - Develop a data model

Learners were expected to ensure that this section was clearly visible in Wiki in their private group area. This task was shared within the group.

1. Draw a current physical data flow diagram using Britton and Doake notation (in the course text book) that clearly labels the input and output flows and shows the system boundary.
2. State any assumptions you have made, and document at least two questions that you have asked during your requirements capture (Activity 2 above).
3. Using your own words in one sentence state how the Data flow diagram relates to requirements.

Activity 4 is built on the core task activity 2 and provides an opportunity for learners to co-produce models to help understand the development of a computer system whilst working collaboratively on the model. This also requires learners to relate to earlier work reinforcing concepts and helping learners, together, build knowledge and demonstrate this progression in knowledge development through the development of the model using the

Wiki. In this way, the tutor can bring misunderstandings forward into the lecture and clarify any misconceptions thus providing formative feedback on the assessment.

3.4.2.5 Activity 5 (Individual) – A reflection

This task was an individual task and intended to help learners reflect upon the process of the collaborative experience. Using their Blog on the University Managed Learning Environment each individual group member was required to keep a week-by-week reflective log of the process undertaken to complete this assignment, to help them reflect upon their experiences of group working. This formed part of the final group report submission. They were permitted to use pictures, sound etc. to describe their experiences. The Blog was not to exceed 10 pages of A4, was not permitted to be made visible to the group before the submission date. The Blog was accessible online by the tutor and had to include evidence to support their reflections. They were permitted to use screen shots in Wiki and/or the other technologies provided/used. Learners were provided with suggested headings and asked to write a paragraph describing the usefulness or otherwise of keeping the weekly Blog and of posting reactions to the week's use of Wiki, the alternative technologies, reflections on group assignment and the group process or anything else that was personal to them.

The intention of activity 5 was to help learners to learn by regular reflections on experiences and for the tutor to gain insights into the learning process in a system of mass Higher Education in an attempt to gain insights in the three

main key areas of interest: **collaborative learning, technology,** and the **tutor** as set out in 0.

The overall learning objective is to apply the principles and techniques of system development in a team environment, thus fostering and developing collaborative working skills (University of Hertfordshire, 2005). This requires learners to move from problem identification through to implementation and evaluation. The 'core task', the problem identification (requirements elicitation and documentation) phase was recorded by the tutor and linked to Wiki contributions. This activity was crucial in the software development process with all the other group tasks building on this. Each of the learner groups was required to complete a report as part of their assessment. In summary, the learning was designed based on active participation in learning. The recordings were listened to by the tutor and a selection was sent to the internal examiner in keeping with quality assurance procedures. Following internal moderation, a sample was made available to the external examiner on a DVD, for scrutiny.

3.4.3 Outcome - Produce a report

Learners were expected to produce a report to meet the module learning outcomes which consisted of solutions to five set learning activities as described in the preceding sections. The learners were provided with the Wiki learning environment, the design of which is discussed in the next section to support the undertaking of the learning activities. The contribution

to the Wiki learning environment in itself was not assessed, by this I mean 'actual' contributions made by individual learners, given the Wiki facilities were provided as 'tools' to supplement and support the undertaking of collaborative learning. However, to engage fully with the assessment learners were required to use the Wiki and to show evidence of this in the fifth learning activity. In this way, learners were encouraged to reflect upon the collaborative experience. The next section discusses the design of the Wiki learning environment as a part of the blend in learning to support the collaborative student learning experience.

3.5 The Wiki learning environment – technology

The next section introduces the Wiki learning environment, represented in the Pedagogy leaf of the conceptual framework in Figure 2.3 and designed by the tutor to support the collaborative experience. Interconnections exist between the tutor and pedagogy leaves in Figure 2.3. Again upfront investment in terms of time was required by the tutor to design the Wiki. It was necessary to seek and obtain technical guidance, provided by the Jotspot support network. This required the tutor to email and to use the online help facilities provided. At times, the tutor sought advice from local technical support. The insider and outsider tensions are discussed in Table 4.1.

3.5.1 Familiarity with video, and podcasts

It was necessary for the tutor to develop the skills to provide a blended learning experience for learners. With this in mind, time upfront was necessary to become familiar with a range of technologies which were used in this study such as video, and podcasts (audio) to present the core task in different formats including paper. These technologies were used as a direct response to feedback from previous studies (Doolan 2006; 2007a) and in keeping with the collaborative/community ethos in practice and a dialogue with learners. In response to learner feedback ascertained in the exploratory study in Chapter 4 the assessment design reflected the changes in the Wiki design, based on suggestions and learner feedback relating to its use to support the collaborative experience. In previous studies learners reported positively that, a Wiki could

“provide confidence to the individual to effectively contribute their ideas” and “so if I put my idea forward either in text, images or diagram and am not correct someone else in our group can edit it” (Doolan 2007a:81).

However, learners in this study also reported there was a lack of visual cues when working and relating with others;

“no visual audio feedback, people may take things the wrong way” and “lack of true response, facial expression”(ibid:81).

Therefore, in this study learners could select between audio, video and text to complete the core group task (activity 2 in section 3.4.2.2) and to present

this as a group, such as jointly edited video and podcasts (audio) linked to Wiki contributions.

This approach offered learners the possibility to personalise their own learning environment and present the associated tasks in a more enriched way using different technologies. As a group, they were able to select the tools and media most appropriate for them, and to allocate specific tasks to individual group members, for example, video and podcast recordings that required the sharing of editing responsibilities and the mixing of different media (Doolan, 2008). Individual and group contributions to the Wiki learning environment were supported by the use of the individually assessed Blog reflection task (activity 5 in section 3.4.2.5).

3.5.2 Alternative Web 2.0 technologies

Each group was provided with a private group space in the Wiki as described in section 3.6.2 in addition to a communal space shared by the whole cohort of learners in the Wiki. The Wiki was accessible via the university MLE. Alternative media which included videos to support visual learners and podcasts to provide audio and linked to Wiki contributions were created by the tutor and provided to support the collaborative experience as shown in Table 3.3 and could be used by learners at anytime. In this way, learners were provided with additional asynchronous and remote experiences in the Wiki learning environment supported by the class based sessions and the use of the discussion facilities.

3.5.3 Using a web cam

The core task was recorded by the tutor using a web cam as all other group-assessed tasks were dependent on the completion of this task. Once the recording was complete the video was edited in Jumpcut (Jumpcut, 2003), a freely available software, and uploaded onto the Wiki as shown in Table 3.3. Audio was produced from the video the audio file - a podcast that was uploaded to the Wiki as an additional resource shown in Table 3.3.

<p>Requirements</p> <p>Post the results of your recording of your chosen method here (below the Group Tutor example) you may create a page off this page, simply link to your work on this page or add an attachment. What is important is your work runs, it is clearly visible, ensure that you include you group number on your work see the example below.</p> <p>An example created by (GroupTutor) An illustration of recording using a podcast is attached to this page see below. You may open this in a media player for example itunes or download this to an mp3 player.</p> <p>An illustration of a recording of the method: direct observation using the device: an audio webcam to record and edited using Jumpcut is here, this video is streamed so press play after the status bar has completed otherwise the recording will appear broken http://www.jumpcut.com/view?id=098464E8644D11DBB081A6B200DB926D&type=movie</p>

Table 3.3: Tutor podcast and video using freely available Web 2.0 software

As shown in Table 3.3, the learner had access to alternative Web 2.0 social software including podcasting (audio) and Jumpcut (video editing software). The podcast (audio) file was uploaded to the Wiki and was shown as an attached file at the bottom of the Wiki page. Learners could download this to their own listening device such as an mp3 player. In this way, it was intended

to provide a flexible learning opportunity where learners could listen again at their convenience. The video was downloaded by the learner. The video was then streamed whilst the learner watched. Again, this could be downloaded by the learner to 'watch again 'as shown in Figure 3.1.



Figure 3.1: Tutor video produces with a webcam

3.5.4 Supporting the Wiki and task completion

Given that the discussion facilities are embedded in the module and given learners familiarity in using the discussion facilities (see section 3.3.2) learners were advised to continue with its use and to post questions relating to the assessment in addition to the Wiki learning environment. This decision was made based on the differences in the technologies. The discussion

facilities on the university MLE provide opportunities for learners to post and respond to posting. The Wiki was used to support the undertaking of the learning activities and its functionality supports this as described. In this way the use of both technologies extends and continues the tutors' intention to promote an ethos of a collaborative learning environment.

Moreover, this online dialogue approach continues to build a repository of questions, encourages ideas and knowledge exchange reinforcing the sharing concept. Finally, its use makes visible to the tutor misconceptions relating to the subject matter and thus the tutor can reaffirm concepts in class. This was the practice of the tutor using the discussion facility. The tutor did not facilitate the Wiki content but rather designed and populated the Wiki with content to support the undertaking of the five learning activities for the assessment. The design of the Wiki learning environment is presented in the next section.

3.6 The Wiki Pedagogy

This section discusses the role of the tutor in setting up, developing and managing a collaborative Wiki learning environment. The discussion represents two leaves of the conceptual framework in Figure 2.3 and the interconnections between the tutor and pedagogy. The design decisions are based on the theories set out in Chapter 2. Images of the design of the Wiki pages are provided as examples of the design and development by the tutor of the Wiki learning environment. The images are provided where relevant to

demonstrate the functionality of the Wiki and related to the learning design and support for collaborative learning.

3.6.1 Choosing a Wiki

Tutor time was needed for the up-front design and development of the Wiki learning environment. A comparison of Wiki applications was made at: <http://www.Wikimatrix.org/> to decide upon the most appropriate Wiki application to use in the context of learning on the Information Systems Development module. The Wiki application Jotspot (www.jotspot.com) was chosen by the tutor. The choice was made based on 'fitness for purpose', as it had to support the assessment design in light of the learning objectives and outcomes and for pragmatic reasons, as the Wiki was freely available. Crucially, the functionality was intended to support the assessment design and the tutor in setting up the collaborative experience. Therefore, it was important that the Wiki functionality supported group management and restricted access amongst groups and features that allowed for different spaces within the Wiki to be created. In addition, the Jotspot (www.jotspot.com) Wiki application provided the server space for storing the Wiki pages and the creation of new pages using the standard formatting tool in *Word*. Access to the Wiki could be restricted and left open or could be secured and closed. The tutor chose closed access as secure access was essential given the Wiki was being used to support a collaborative learning experience through assessment.

3.6.2 Private and communal spaces

'Private' and 'Communal' group spaces were set up by the tutor. The private group spaces were accessible only by the six learners within a group. The 'communal' space was a shared space and designed to be accessible by the cohort of learners studying on the Information Systems Development module, keeping the 'collaborative' and 'community' aspects of the learning experience in mind. The Wiki design was intended to support the assessment design in this way, as for the assessment design the group and community spaces in the Wiki encouraged learners to collaborate with each other between (inter) and across (intra) groups to build relationships and group dynamics, as well as interdependence between each other and, like the assessment designs, to promote 'mutual' engagement, participation and a 'sense' of belonging to a community. Private access was essential, as the tutor wanted to create a 'private' space for student groups to support their assessment whilst attempting to minimise plagiarism and unwanted collusion. The 'communal' space was necessary to provide learners with a shared working space. The Wiki was used by the tutor to house the learning materials necessary for the collaborative experience and to complete the five learning activities as described in the next section.

3.6.3 The tutor's familiarity with the Wiki

Once the Wiki was chosen, as with the preparatory activities, time was set aside for the tutor to become familiar with the features of the Wiki. The tutor's role was to set up the Wiki learning environment and populate this with the learning activities (as discussed in the previous section) and associated learning materials, templates and resources required for learning.

3.6.4 Wiki design structure

The Wiki pages were unstructured, therefore the tutor focused on the design structure aligned with the learning activities. The design was based on the tutor's experience of interface design and guided by using three guidelines for sociability and usability and related to online community development described by Preece (2001) as follows:

1. *Define community purpose:* Provide clear meaningful name, additional information on the web page that supports the statement of purpose
2. *Access:* provide a clear statement about technical and other access requirements.
3. *Effective Communication:* support personal presence, establish common ground, encourage empathy, trust, consideration.

Following the three guidelines, a clear, meaningful name and additional information was provided on the Wiki homepage as shown in Figure 3.2. In

this way, the homepage supports the statement of purpose that defined the community and supports sociability aspects.

3.6.5 Wiki access details

Learner access to the Wiki was by username and password and by a web link. The access details were emailed by the tutor to learners with information on how to use the technology with their unique group number and names of other group members. In addition, the group list was placed in the Wiki. Learners do forget passwords and the 'invitation' email expires after 7 days if not used hence, the need to resend. This was the case for two learners.

3.6.6 Module homepage

Aligned with the guidance by Preece (2001) a clear statement about technical and other access requirements was provided to learners. Once inside the 'communal space' learners were presented with the module homepage as shown in Figure 3.2 The tutor provided a brief introduction to the Wiki on the page, in addition to a hyperlink to both technical and academic help and the tutor's email address. These were intended to provide further guidance when using the Wiki. The page permissions in the Wiki were parent-child, in other words if access is prevented to the parent page, in this case the homepage, the underlying pages would also be restricted, hence the need to include the message "*Please do not edit...*" on the Wiki home page as shown in figure 1. The design of the homepage was based on

the design principles of sociability and usability described previously and the importance of the tutor in getting the design 'right' for its intended purpose to support learners in the collaborative learning experience. To this end, there are five links on the home page (4 of which are visible in Figure 3.2)

1. **Notice Board** This was intended for general notices and to be edited by the tutor and learners alike.
2. **Assessment Details** These were editable only by tutor, with read access for learners. This provided all the information about the assessment including the coursework specification and the case-study needed to undertake the assessment. It was intended that learners would link to this from within their 'group space' to act as a permanent record or a guide.
3. **The Resources for Learning** page contained links to research papers and all resources for learning for this assessment. Both the tutor and learners could edit this, indeed the learners were expected to add resources to this page as part of their learning.

4. **Group Details** link enabled learners to access their private group space. This was only available to the group members of six and to the tutor.
5. **Comments page** (not shown on this screen shot). This was intended as a space for learners to ask for help. Tutor and learners alike could respond to comments posted.

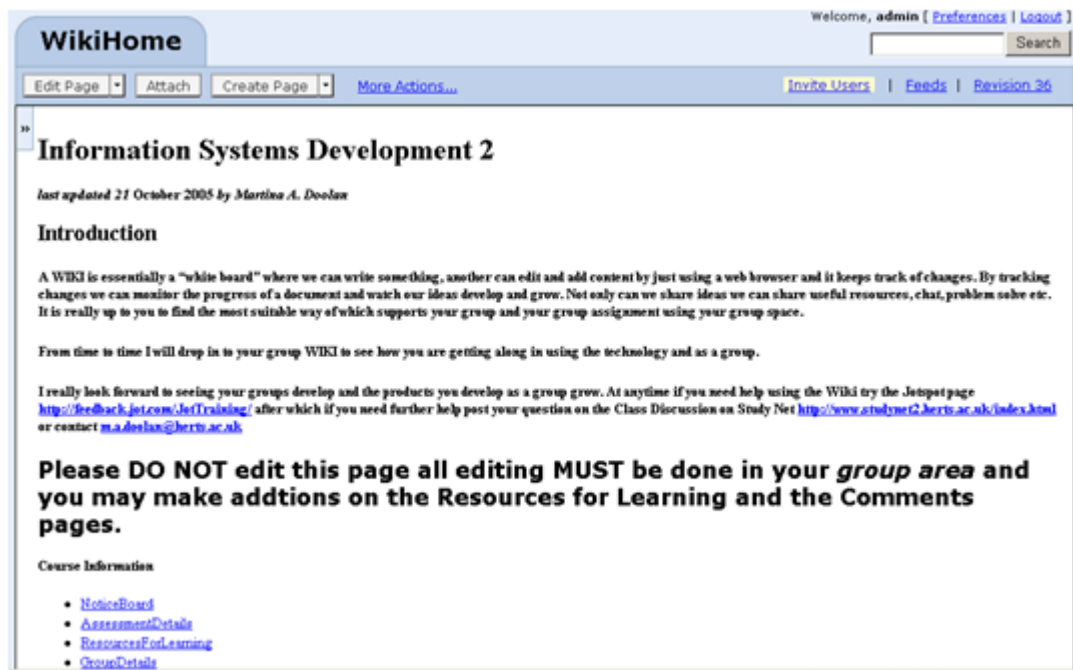


Figure 3.2: Module Homepage

3.6.7 Assessment details

The assessment design was discussed in the previous section. The tutor made available the assessment details within the Wiki learning environment

as shown in Figure 3.3. This was accessed by the learner by clicking on the *Assessment Details* hyperlink as shown in Figure 3.2.

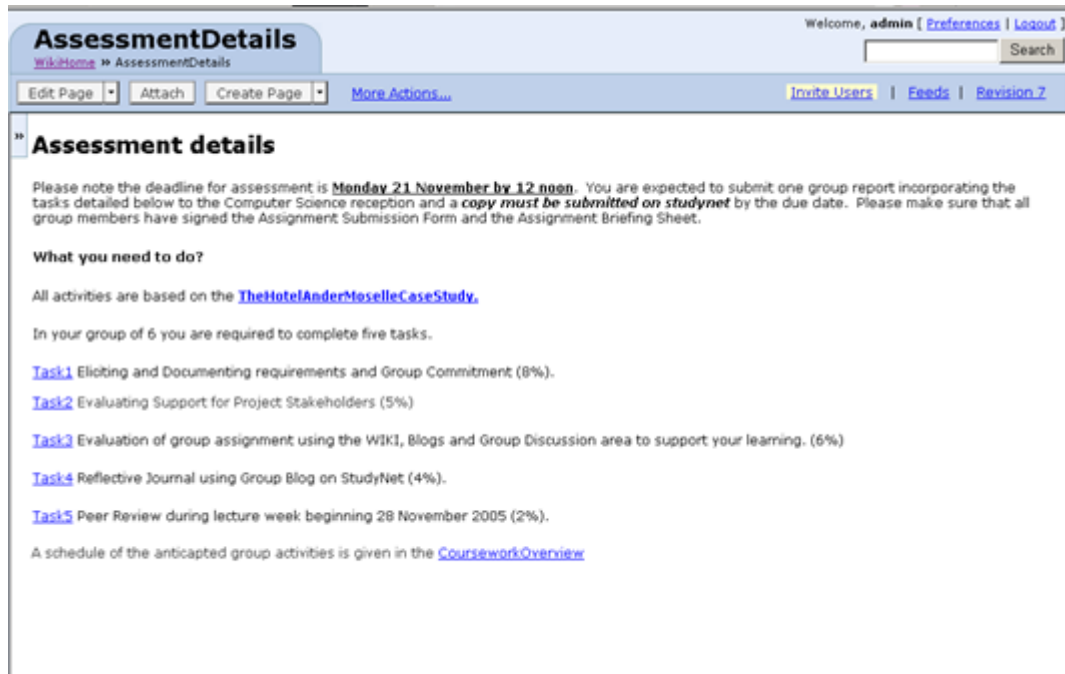


Figure 3.3: Assessment Details page

Information on key dates for assessment submission and requirements for assessment are shown in Figure 3.3. Learners were made aware that all tasks were based on the case study for the assessment as discussed in section 3.4.2 and provided with a hyperlink to access the case study. Instructions were provided for working practice. Each task as shown in Figure 3.3 is a hyperlink to a page; this enables the learner to gain further information about that task by clicking on the hyperlink. In Figure 3.2, a one-sentence description is used to describe the task and an indication as to the assessment weighting of that task. Once the hyperlink *CourseworkOverview* shown in Figure 3.3 is selected, a learning schedule was available to

learners, intended to help learners to manage the learning activities as shown in Figure 3.4.

The Coursework Overview was intended to provide a framework to help learners manage the assessment. This framework was presented in the form of “weekly activities” which were based on the university academic calendar and documented under the following headings: **Wk. Beg** 17Oct 2005 denotes week beginning 17th day of October 2005. **Content** provides an indication to the learner of the task content that is aligned with the five assessed set tasks. **Assignments** provides detail of the task set, **Wiki activity** provides guidance on using the Wiki for the set task. This was necessary given the unstructured nature of the Wiki and the exploratory nature of this study.

Coursework Overview			
Wk. Beg.	Content	Assignments	WIKI activity
17Oct 2005	Eliciting & Documenting Requirements.	<p>Task 1.</p> <p>Requirements in context using alternative technologies. Eliciting and Documenting requirements. Group Commitment.</p>	<p>Meet with your group online post a picture that represents you and a brief description of yourself along with the other requirements documents in the file ISD/CWI/Student_Instructions/MAD. Check out the WIKI to see who I would like to be!</p> <p>Eliciting Requirements – Brainstorm session. Using WIKI as “white board” to brainstorm and capture ideas, requirements.</p> <p>Alternative technologies readings posted in Wiki</p>
24Oct 2005	Documenting Requirements using template.	<p>More of Task 1 More Eliciting and Documenting requirements.</p> <p>Documenting Requirements template</p>	<p>Documenting Requirements. Summarise your “brainstorming” ideas using the template provided by me in the WIKI. This must be submitted by the due date for coursework 1.</p>

Figure 3.4: Coursework Overview

3.6.8 Group details

Once a learner clicked on the **Group Details** as shown in Figure 3.2, learners were presented with a 'group door step'. The 'door step' for Group 3 is shown in Figure 3.5; this relates to the corresponding 'private' group space for Group 3. To help learners to locate and orientate themselves whilst on the group 'door step' Wiki page, a "*You are now one click away*" statement was provided. Learners were reminded that the tutor was monitoring the process "*I will look in from time-to-time to review your progress*" and learners were reminded of how to get technical help. Again, given the page permissions constraints, it was necessary to have the text "*Please do not edit this page...*" The group list was attached to this page, with the learners' unique group number, name and names of other group members, as learners tend to forget group numbers. Learners then clicked on *GroupThreeArea* shown in Figure 3.5 to access a private group space. This was comprised of blank Wiki pages. This was intended for learners to create their own 'dynamic' learning environment according to the needs of the group.

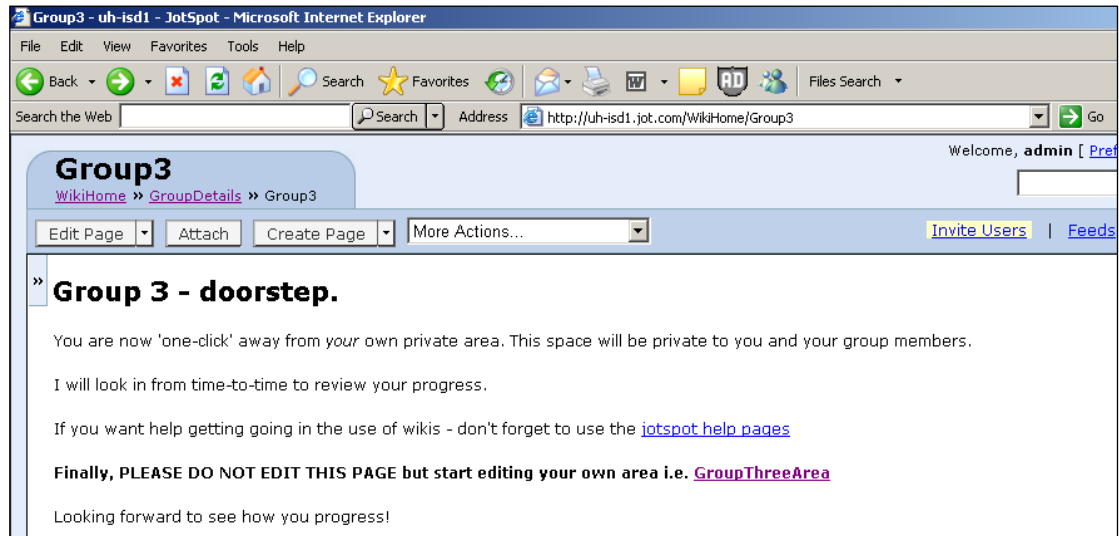


Figure 3.5: Doorstep – one click away from private group space

Once developed, the Wiki was integrated with conventional teaching practices with the intention of providing more opportunities for learners to interact with each other outside the classroom in order to undertake the group-based assessment. These interactions were intended to provide learners with a stronger sense of being connected to one another and to an increased construction of knowledge through co-creation of content and discourse, thus providing stronger feelings that educational goals were being satisfied by the learners and indeed a sense of belonging to a collaborative/community learning environment.

3.7 Conclusion

Grounded in the conceptual framework critiqued in Chapter 2 this chapter set out the learning/assessment design, using a blend that combined Wiki

technology and class based learning. The learning/assessment design described a clear role for the tutor in establishing a Wiki learning environment in addition to class based learning to support collaborative learning through assessment. The argument was made that, when used in this way, a Wiki is a learning resource to support collaborative learning.

The discussion was based around the three leaves of the shamrock of the conceptual framework in Figure 2.3 and aligns with the three key research themes: **tutor**, **technology** and **collaborative learning** presented in 0.

The following chapter justifies the methodological considerations appropriate to the researcher and the research questions.

Chapter 4 Research design, methodology and data collection methods

0 presented the background and provided the justification for undertaking this study. Chapter 2 provided the literature to ground the theoretical framework to inform the research, concepts and theories of this study. Chapter 3 put into practice the theories and concepts in Chapter 2 and argued a clear role for the tutor whilst designing a blend comprising a Wiki and class-based learning. This chapter describes the research design, the methodological considerations, the data collection methods and the data analysis techniques utilised in order to answer the research question.

4.1 The research question – statement of the study purpose

The need for this research has been discussed in section 1.5, the research background in section 1.6 and the research questions in section 1.7 and defined to help understand:

How can technology be used to support learners and teachers in collaborative learning through assessment?

To address this question the original contribution to practice was based around the three key themes of this research: **tutor**, **technology**, **collaborative learning** presented in 0 and allowed the development of an appropriate conceptual framework critiqued in section 2.8, hence the sub questions:

1. *What is the learner experience of collaborative learning through technology?*
2. *What is the role of the tutor in technology supported collaborative learning?*

These questions are based around understanding perceptions and experiences of learners and the tutor involved in this study. Therefore, the research approach felt appropriate to address the research questions lies within an interpretive framework and uses Blogs, and observations and analysis of contributions made by learners to the Wiki. In summary, evidence of the impact on the learner experience is drawn from the learners' self-evaluation statements derived from their self-reflections captured in a Blog that evaluates the students' perceptions of their experience. Evidence is also drawn from contributions made by learners to the Wiki technology. The role of the tutor in practice is documented in Chapter 3; observations and personal reflections of practice were captured daily and supported by the use of a journal. Thus the focus of this study is interpretive and involves collecting and interpreting subjective data (Silverman, 1993).

4.2 Theoretical context

The nature of my study dictates a subjective and interpretive stance, typical of a case study. Case studies have been used in the field of education (Stake, 2000; 2006) with emphasis on teachers and learner experiences of social phenomena that is relevant to this study. When applied as a research strategy (Yin, 2003) a case typically refers to a person, an object or entity

such as a university. Yin (2003) suggests that the researcher when using a case study approach to research design acknowledges that there are multiple realities given the subjective and interpretive nature of the case study. Multiple realities are supported by the view espoused by Vygotsky (1978) relating to the theory of social constructivism and critiqued in section 2.1.1. Given this multiple view of social phenomenon, there is a need for the researcher to clarify her perspectives, the case, participant and others, which may or may not come together whilst carrying out a research study (Yin, 2003). With this in mind, this section justifies my role as a researcher and the theoretical influences on my methodological considerations in this thesis. The case study as the research strategy for this study espoused by Yin (2003) is justified later in the chapter.

The underlying theory that shapes my perspective is community of practice Wenger (1998). I am aware of the tensions experienced within the multiple communities whilst undertaking research into my professional practice, as illustrated in Table 4.1. In summary, Wenger's work espouses the view that we belong to and participate in many communities. For me these include my role as a principal lecturer in the School of Computer Science, my university-wide role at the Centre for Excellence in Teaching and Learning (CETL) Blended Learning Unit (BLU) and the doctorate peer group to whom I belong during the doctoral programme study days. Nationally, I work on projects with the Joint Information Systems Committee (JISC) and the Higher Education Academy (HEA). As a National Teaching Fellow I belong to the Association of National Teaching Fellows (ANTFs). I regularly attend conferences, and

facilitate workshops across the HE sector; in this way, colleagues can be deemed to act as critical friends (Bassey, 1999).

Opportunities to publish peer reviewed conference publications have also enabled me to further craft my story *“to couple theory and data to develop coherent and insightful points that make a difference in, and contribute to, the discipline’s theoretical conversations”* (Golden-Biddle, and Locke, 1997:12). It is suggested by Golden-Biddle, and Locke (1997:13) when referring to publishing ones research, *“Only when it is cited and its findings are used in future published articles will a piece of research have achieved the status of knowledge”*. It is through this process that I have come to realise that I view knowledge not as fixed but as a continuum, ever-evolving, based on participations and interactions with others, situated in a social context. This is demonstrated in previous studies in Appendix C, which shows that I have developed knowledge in applying research methods and developing research skills of inference and theory building using qualitative and quantitative research methods. This knowledge and these skills influence the research stance and the pragmatic methodological considerations in this study to enable me as the researcher-practitioner to focus on seeking answers to the research questions.

Opportunities for community peer review is described as a ‘special kind of reflectiveness’ and defined as

“the struggle towards representation of form, meaning and way of knowing [that] is the essence of interpretive dissertation inquiry” (Garman and Piantanida, 2006; p.ix).

In my experience, form and meaning are derived through trying out theories, ways of knowing come from testing and making sense of ideas and practice through, for example, peer reviewed conference publications (see Appendix C) and engagement with others. By *“paying attention to both the theoretical points we develop and how we argue them, we begin to demystify our professional writing and become more reflexive about our own and others writing”* (Golden-Biddle, and Locke, 1997:16). This reaching out provides an opportunity to reflect on myself, reaching in and acquiring new knowledge and ideas whilst building on the old. At the same time this helps to validate and bring authenticity to the research, my practice and the work of colleagues within these multiple communities of practice.

During these mutual engagements, I find myself forced to take stock and step back, think and explore these new insights whilst making inferences and derived meanings from the data in the participant’s own works and questioning the meanings behind my own belief systems and within my own practice both as a researcher and a practitioner. Strauss and Corbin (1998:45) promote this stepping back in qualitative research and go on to advise researchers to ask the question “Do I see what I am thinking in the data?” (ibid: 45).

However, I have experienced first-hand struggles and tensions as posited by Garman and Piantanida (2006). Whilst researching I have become aware of the tensions in my different self's; researcher, practitioner, tutor, module leader, programme tutor, blended learning teacher, and computer scientist (see Table 4.1). These are referred to by Hellowell (2006) as the insider-outsider tensions.

4.2.1 The insider-outsider tensions

It is argued by Hellowell (2006) that, when engaged in research and practice simultaneously, the research is influenced by this continuum and is perceived as tension. Hellowell's work posits such tensions have an impact on the research stance, preferences and choices whilst engaging in research in one's own practice. With this in mind, in this research, the researcher-practitioner takes the view of self as an instrument of the research and recognises the tensions associated with researching in one's own professional practice, demonstrated in Table 4.1.

Hellowell (2006) cautions that status and role impact on the research process, particularly on how the researcher is perceived by the participants, in this case, learners. However, Miller and Glassner (2004) argue the benefits the insider-outsider view brings to the research as the researcher-practitioner is familiar with the culture and ethos in the social phenomena, in this study the HE institution. With this in mind, the reflexivity shown in Table 4.1 brought these tensions to awareness.

	Insider	Outsider
Location		
UH	Member of Academic staff Principal Lecturer	Public organisations in industry given UH are in the public sector
Centre of Excellence Blended Learning Unit	I am a teacher in computer science and an educational researcher in blended learning	I am the pre technology age hence not of the net generation
Students		
Gender	Predominately Male	I am female
Nationality	On this undergraduate module students are predominately English	I was born in the republic of Ireland therefore, I am Irish
Entrants	The majority of students are 18	I am older than the majority of students
Status	Students are undergraduates but I am a student as a postgraduate undertaking the doctorate.	Tutor, programme tutor, module leader on the module under study. I am a UH teaching fellow and a National Teaching Fellow
Added Tensions		
Culture	I am committed to the empowerment of students and in giving students a voice – learner as co-producer and community/collaborative learning	Few practices across the HE sector on student as co-producer. Student expectations of tutor role may be different.
Blended Technology	Engaged some years, regarded as an 'expert' work with the Centre Excellence in Learning and Teaching focus on Blended Learning.	Yet to be defined in the sector, the concept is under researched.
Collaborative/ Community Learning	Very committed to collaborative learning. Long history of studying and using group work in	I am not 'part' of the group process I am on the outside responsible for designs, looking in

	teaching and assessment	and providing support.
Language	Subject language in Computer Science 'Practical' application	Educationalist 'Theoretical concepts'
Political	Subject knowledge- Value Added	Teaching and Learning Practice undervalued

Table 4.1: Insider-Outsider Analysis (adapted from Hellowell (2006))

Table 4.1 shows that I am an academic in the field of Computer Science at the University of Hertfordshire. I am teaching on the Information Systems module under study. I have an invested interest in blended learning with a wealth of experience and widely published in this area. I have been especially interested in investigating the effectiveness of Wiki to support group-based assessment for over 5 years. I am a female who is older than the majority of students who are male. The population data was presented in Chapter 3 . Each of these influences my research stance and shows the power in balance between me as a tutor and the learners as participants in this study. However, I did not mark the assessment.

4.2.2 Bringing insider-outsider tensions to awareness

Bringing these tensions to awareness resulted in using tried and tested research methods, exploring their use in the study 1 in 2005 and 2006 and validating their use in the study 2 in 2006 and 2007. These tensions also prompted me to disseminate practice as the study progressed throughout the life span of the doctoral journey (see Appendix C). In the works shown in

Appendix C in addition to the studies presented in this thesis I have paid particular attention to the fact that *“we employ data as evidence to support, substantiate and advance our theoretical points”*(Golden-Biddle and Locke, 1997:76) and recognise that my role as tutor is *“a variable in the enquiry”* (Bassey, 1999:43). To this end, data emerges from my position as an ‘insider’ from my observations as a tutor and based on my experiences as a researcher-practitioner. In this way I am not an *“objective outsider”* (Bassey, 1999:43), rather, in this thesis, I take a subjective and interpretive stance appropriate to the research questions (Silverman, 1997).

I am mindful of the vast quantity of data derived in this study and made a decision based on the research questions to focus on the qualitative data. Denzin and Lincoln (1998:4) describe this approach as *‘bricoleur’*, where the researcher becomes *“adept at performing a large number of diverse tasks ...to observing, to interpreting personal and historical documents, to intensive self-reflection and introspection”*. These result in *“patterns of action and interaction between and among various actors”* (ibid: 4).

As the research progressed I chose the research stance most applicable to the research questions whilst authenticating and validating the research. This is supported by Robson (2002:81) *“when you know something about the research questions you want to be answered, then you are able to make decisions about the methods to be used and the strategy to be used”*. This research is explanatory in nature, asking the “how” and the “what” (Yin, 2003) whilst my reflective positioning builds upon Boud et al (1985) in their work turning experience into learning. Additionally, my research stance is

supported by the work of Denzin and Lincoln (2005:454) who offer, “*in a social process, together people bend, spin, consolidate, and enrich their understandings*”. In my experience this has been achieved through involvement in multiple communities of practice as discussed in section 4.2.

At the same time, I have been engaged in making observations (Robson, 2002; Silverman, 2000) of my practice in my role of tutor and of the learners’ contributions in class and using the technology such as the Wiki and the discussion facilities provided to support learning. These are illustrated using a narrative and images of my practice in Chapter 3; of learners’ own works illustrated in their reflective Blogs and through contributions in the Wiki (Silverman, 2000) and are presented in Chapter 6. The case study as my research strategy and its appropriateness to interpretive and subjective inquiry (Silverman, 1993) is justified in the next section.

4.3 The case study research strategy – methodology

4.3.1 A case study

The nature of the research problem provides an indication as to the most appropriate methodology (Creswell, 2007). This determines the specific methodology and research methods to be used to answer the research question (Yin, 2003). In this study the question is explanatory - “how” - and therefore this is appropriately answered using a case study (Yin, 2003; Robson, 2003). The case study helps to “*establish operational links ... rather than mere frequencies or incidents*” (Yin, 2003:6). This is necessary in this

study to establish the links between the 3 key research themes: **the tutor**, **technology** and **collaborative learning** to address the research question.

The case study is a tried and tested method and used widely in many professional and practice-based fields (Hammersley, 1992; Bassegy, 1999; Stake, 2000; 2006; Robson, 2002; Denzin and Lincoln, 2005) and commonly used to undertake qualitative inquiry (Stake, 2002; Robson 2002; Silverman, 2003; Denzin and Lincoln, 2005).

The case to be investigated *“is almost certainly going to be a functioning body”* (Denzin and Lincoln, 2005:444). In this study the functioning body comprises groups of learners studying on a module in a university setting and provides for naturalistic inquiry rather than through experimentation (Pope and Mays, 1999; Denzin, 1994; Robson, 2002) allowing the learners own experiences of the collaborative experience to be revealed through their reflective Blogs as *“most cases have working parts and purposes, many have a self”* and are *“representative of”* (Denzin and Lincoln, 2005:444). What is important in this study of social phenomena is that experiences are interpreted in a naturalistic inquiry. With this in mind, my study is considered an intrinsic case as this case study parallels with real life experience where *“one wants a better understanding of this particular case”* (Denzin and Lincoln, 2005:444). In this study the single or ‘intrinsic’ case (Stake, 1998: 88-89) is used in study 2 which took place in 2006 and 2007 and comprises sixty learners undertaking an Information Systems Development module in a university setting as described in Chapter 3. This meets the widely held

definitions of a case study (Denzin and Lincoln, 2000; 2005; Robson, 2002; Yin, 2003; Silverman, 2000).

The case study is 'bounded' (Stake, 2000; Yin, 2003; Denzin and Lincoln, 2005; Creswell, 2007). By this they mean it has a clear boundary. The boundary in this study is the Information Systems Development module. Good case study practice teases out and gains insights, whilst the researcher is disciplined in practice (Robson, 2003; Stake, 2006). To this end, the context is made explicit (such as a group of learners studying on a module in a university setting), the sampling strategy is made clear, reputable and tested research methods were utilised for data capture and comprised multiple sources of data including texts and images in reflective Blogs, tutor observations, reflections, and Wiki contributions. Data analysis involved the coding of data and was undertaken using the tried and tested technique of content analysis (Robson, 2002; Krippendorff, 2004). The case study approach used in this study therefore, meets the criteria of Robson (2002) who emphasises the important points related to a case study as:

- A *strategy*. i.e. stance or approach, rather than a method i.e. observation or interview
- Concerned with *research*, taken in a broad sense and including, for example, evaluation

- *Empirical* in the sense of relying on the collection of evidence about what is going on
- About the *particular*: a study of that specific case (the issue of what kind of generalisation is possible from the case, and of how this might be done, will concern us greatly)
- Focused on a *phenomenon* in context, typically in situations where the boundary between the phenomenon and its context is not clear, and
- Undertaken using *multiple methods* of evidence or data collection.

4.3.2 Triangulation

According to Denzin (1970) triangulation is used when accessing social meaning. Triangulation brings clarity to communications (Stake, 2000). Triangulation, as defined by Denzin and Lincoln (2005), in case study research, serves to “*clarify meaning by identifying different ways the case is being seen*” (Denzin and Lincoln, 2005:454) and draws upon the concept of different lenses (Morse, 1998). In this study triangulation is undertaken to bring clarity and to draw on different lenses to identify different learner experiences. This took the form of comparing data within the learner reflective Blogs when deriving themes or categories whilst undertaking content analysis on each reflective Blog and between the data of the different learner reflective Blogs. Data in the reflective Blogs was triangulated with contributions made to the Wiki by learners.

This was invaluable as this highlighted differences and similarities in tutor and learner perceptions of the collaborative learning experience in both the

Wiki and class based environments as shown in the peer reviewed conference papers provided in Appendix C. These papers demonstrate how the tutor reflections based on observations of practice and triangulated with the narratives within the learner reflective Blogs provided different insights from the different perspectives of learner and tutor, highlighting the impact of the role of the tutor, the technology, the collaborative experience (and the importance of learning lessons relating to the collaborative experience) and the support and weaknesses that the technology affords in collaborative learning.

4.4 Methods and techniques of data collection

This section describes and justifies the methods and techniques for data collection and data analysis that I have considered and utilised in this study. Data has been collected from multiple sources including tutor observations and reflections in practice and learner reflective Blogs maintaining a record of evidence which *“helps to identify different realities”* (Denzin and Lincoln, 2005:454) and pertinent to triangulation as discussed and justified in the previous section.

4.4.1 Tutor observations and reflections

It is important to acknowledge and understand one’s own values and interests, decisions and rationales (Lincoln and Guba, 2000) and the impact these have on one’s research. Robson (1993; 2002) posits that this brings

clarity and credibility to the research. With this in mind, the tutor's own observations were documented as notes in a journal using the Microsoft Word application (Microsoft Corporation, 2010). Observations documented comprised the learners' experiences in class and technology use and the tutor's own experiences of practice. Extensive use was made of the Wiki and the module discussion facilities embedded in the University's MLE in this study (see Chapter 3 for the details of the learning design and Chapter 6 for a discussion of the findings). Therefore, attention has been paid to the learners' own uses of the technologies, for example works produced in text, video clips, and images and "*seen as a process of discovery, concentrating in the first instance on each individual as a separate case, a possibly unique world*" (Ashworth 1997:12).

The learner engagement with the technology was used to provide illustrations of learners' own works to support the analysis of the collaborative learning experience (Doolan, 2006; 2007a; 2008; 2009; 2010a; 2010b). In this way, this was perceived as "*unobtrusive observation*" (Robson, 2002:310). There are few studies on using observation through technology as a qualitative research method (Bianco and Carr-Chellman, 2002), coined 'e-observation' (Liang, 2007). This has the potential to acquire data (Mann and Stewart, 2000) and has been used as a data collection method (Liang, 2007). The focus of Liang's study was to understand how classroom assessment was practiced in an online learning environment with 10 instructors and 216 students. Observations were recorded in a journal for analysis and were compared with other data sources as in this thesis, which

captures observations via a journal. In Liang's work insights into the learners lived experience (Van Manen, 1990) were obtained through e-observations such as use of colour and emoticons used to represent gestures and other non-linguistic cues. These are referred to as electronic paralanguage (Mann and Stewart, 2000).

In this study learners were informed that their work would be monitored, this was clearly stated on the homepage of the Wiki and on the assessment (see 7.9 Appendix B). In addition, ethical approval was sought and gained given the nature of e-observation. According to Liang (2004) the participants in this study although made aware of being observed were found not to notice this. I have no reason to believe the Hawthorne effect was evident (Sim and Wright, 2000) which sees changes in behaviour of those being observed through the process of observation.

To this end, observations of practice were kept in a journal as written notes and accompanied by screen shots and images to document and pattern my experience as a tutor and researcher. According to Golden-Biddle and Locke (1997:7) in this way, "*what we are doing is thinking about that experience to make some sense of it*". This resonates with me as I found myself learning lessons whilst in the practice of using the technology to support the collaborative experience. Journals used in this way can be seen as a vehicle for reflection (Moon, 2002). This was often written on a daily basis throughout the research. At times, snippets such as emails to and responses from the Wiki technical support team and hand drawn diagrams of ideas, tips and 'conceptual design' notes were kept (see Appendix B.iv) and acted as

observations and reflections of practice. Biggs (2003) espouses the belief that teaching is a reflective activity, especially as teachers have to work out their own solutions.

The tutor observations provided large amounts of useful information and data that resulted in strategies for Wiki use and collaborative learning (Doolan, 2006). This work provided an initial framework for tutors in the design, development, implementation and evaluation of a Wiki to support group based assessment and is developed further in later works (Doolan, 2007c; 2007d; 2010a). These strategies were used by Mathers and Leigh (2008) and McFarlane (2009) in the design and implementation of a Wiki learning environments.

4.4.2 Reflective Blogs

Insights into the students' "lived experience" (Van Manen, 1990: 35) were gained using reflective Blogs as a research method and helped to show how technology can support collaborative learning, a better understanding of the role of the tutor and the learners' experience. Reflective Blogs were the primary data source to capture learners' reflections on the collaborative experience. The reflective Blog as an assessed learning activity undertaken by learners is described in section Chapter 4. The tutor and the individual group member had access to the Blog, which was housed on the University MLE. Reflective Blogs were chosen as these were a tried and tested method in study 1 in the academic year 2005-2006. Additionally, reflective Blogs had

been used in past studies to capture learners reflections on their learning experiences of collaborative learning and group based assessed learning (Doolan, 2004; Doolan and Barker, 2005; Doolan, 2006; 2007a; 2007b; 2008; 2009; 2010a; 200b). In these works, content analysis was undertaken on learners' reflective Blogs. Themes and data derived from the Blogs were shown to provide rich insights into learner experiences of using technology to support group-based assessment. These works also showed that content analysis and an interpretive approach to data analysis were appropriate to use with data gathered through reflective Blogs (Doolan, 2006; 2007a; 2007b; 2008; 2009; 2010a; 200b). An interpretive approach to data analysis is commonly used to understand learners' (human) experiences and participants' views (Cohen et al, 2000; Creswell; 2003; Canole, 2002 Amitage et al, 2007),helps the researcher to understand real life experiences (Bassegy, 1999; Stake, 2000; 2006; Robson, 2002; Denscombe, 2003) and social life experiences (Yin, 2003). This is important in this study given the intention to understand the learners' experience.

Diary keeping through technology is becoming more common. Bolger et al., (2003) offers that reflective diaries using technology provide a means by which to capture particular experiences relating to particular events; in this study, to capture learners' experiences of the Wiki and class-based learning environments whilst working collaboratively. Harley et al. (2007) used both paper based and technology diaries to capture learner experiences. Learners used Blogs as an assessed task to capture learner reflections of the group

based experience in Doolan (2004) and Doolan and Barker's (2005) study making a comparison between online and offline group learning.

An online Blog was also favoured in this study as the nature of the learners, computer science students; as such these learners were familiar with technology. Therefore, reflective Blogs are deemed an appropriate data gathering method to capture learner reflections in this study.

4.4.3 Data analysis

This section justifies the choice of content analysis as the appropriate data analysis technique for this study.

Miles and Huberman (1994) set out guidelines to assist interpretation, which includes the use of content analysis (Robson, 2002), a technique to interpret and codify data by defining data categories. In this study content analysis was carried out as outlined by Krippendorff (2004). At times I did this by hand, at other times I semi-automated the process using the Microsoft Word application (Microsoft Corporation, 2010), occasionally adding memos. The content analysis procedure undertaken in this study involved "*a systematic reading of a body of texts*" (Krippendorff, 2004":3) which is described as a "*fundamentally a qualitative process*" (Krippendorff, 2004":20). Given that the reflective Blogs as a data method in this study captured the learners' own lived experiences (Van Manen, 1990) it was important to me to be close to the data and to get a true feel of the data in its original context. In my experience, the process of content analysis is creative, involving intuition and

empathy whilst generating themes, which, to my mind, is not a mechanical process. In my experience, the intellectual process of actually conceptualising the data can only be done by the human brain of the researcher (Webb, 1999). For this reason I rejected software such as Nvivo (QSR International, 2010). This rejection was also based on my past experience of using Nvivo. In undertaking analysis in Doolan and Stewart (2008) I found using Nvivo forced me to be clear about the size of the unit of text such as the words, sentences and paragraphs prior to data analysis hence the focus was on the codes. This I found rather rigid and systematic and I found that the context of the data was lost. Given that the nature of this study is subjective and interpretive (Silverman, 2000) and based on a naturalistic inquiry intended to identify different realities (Denzin and Lincoln, 2005) of learners' own lived experiences (Van Manen, 1999) it is important to maintain the context of the data. With this in mind, for me as a researcher, part of the process is creative and based on intuition; thus I find it helpful to view the data with multiple lenses. Coding in this way, based on my past experiences (Doolan, 2004; Doolan and Barker, 2005; 2009; 2010b) involves theoretical perspectives and interpretations and in my experience I have found this necessary to make sense of the data within the reflective Blogs.

This I had achieved in previous studies (Doolan, 2004; Doolan and Barker, 2005; Doolan 2006; Doolan 2007a; 2007b; 2007c; 2008; 2009; 2010b) (see Appendix C). In summary I decided to undertake content analysis as this was the most appropriate way to analyse the data in this study in order to answer the research questions. According to Strauss and Corbin (1998:5)

researchers using qualitative methods “*are unafraid to draw on their own experiences when analysing materials because they realize that these become foundations for making comparisons and discovering properties and dimensions*”. A sample of content analysis is presented in section 5.6.1 in Chapter 5.

The next section describes how data was managed in this study; this is followed by a section on ethical considerations.

4.5 Data management

Confidentiality and anonymity were offered to the learners and this reflected the meticulous approach to data collection, analysis, reporting findings and data management. However, despite this, the Higher Education institution, my identity, the module and study programme have been made known as this is necessary to set the context of the research. With this in mind, as the research was to be published, copies were sent to students and learners were reminded they could opt out of the research. Although learner reflective Blogs were part of an assessed activity (see section 3.4.2.5 in Chapter 3) and used in the study to derive insights into the collaborative experience, if students so wished their individual Blog would be omitted from the study.

4.6 Ethical considerations

Ethics approval was sought and granted. This was important in this research given that this research involved human subjects, the learners, as participants in the research. In addition I have used tried and tested research techniques, reflections as documented by the students, undertaken content analysis on the data, managed and presented the data meticulously (subjecting work in progress to reviews such as journal and conference papers i.e. Doolan et al, 2006; Doolan, 2006; 2007a; 2007b; 2007c; 2007d; 2008; 2009; 2010a; 2010b). These have led to changes in the research when necessary and changes in me as a researcher-practitioner and the research practice (Schwandt, 1996).

In this study the learners were notified that the assignment they were undertaking was part of a research project and they had the opportunity to opt out of the research at any time and were reassured that this would not affect the mark obtained for the assessment. Learners were reminded that the individual reflective Blogs would be used for data gathering and were asked to freely document their group working experiences. This information was delivered in a lecture and was included in the materials distributed for the assignment. To retain learner confidentiality no learner names are used in this study. Student confidentiality is maintained at all times in this study; this has been done by allocating each student an anonymous number. Where illustrations of students' works are required to inform the study, for example illustrations of students' contribution to the Wiki, confidentiality is maintained by blurring and at times deleting the text in the screen shots used

to illustrate learners' contribution to the Wiki. However, when presenting illustrations of students' video images created using Jumpcut (Jumpcut, 2006) the video editing tool learners can be identified and hence I have sought the explicit informed consent of all these particular participants to their being identifiable in this manner.

I feel a great sense of responsibility for the wellbeing of my learners when in my charge and have therefore done my utmost to ensure that my students have not been adversely affected by this research. I have made every attempt to ensure that I have undertaken this research with honesty, integrity and with the participants in mind. Kitchenham (2002) explores the importance for the researcher in making explicit any vested interests as a measure to reduce bias in the study. From the outset of the study, I engaged in a dialogue with learners and colleagues alike about my interest in using educational technology. I am committed to writing-up my work throughout the research process, as this helps me to reflect, evaluate and share my work with colleagues via presentations, posters and various publications both internal and external to my host institution (Appendix C) whilst attempting to ensure credibility and validity through peer review. I made every attempt to ensure that all those with an interest in the study including research participants were continuously informed of the research in progress (see section 4.2). To this end, the published works were disseminated amongst learners.

Additionally, at the outset of this study I provided learners who were participating in this study with previously published papers (Doolan and

Barker, 2003; 2004) of other learner experiences of using technology to support group work and assessment whilst in my charge. The intention was to help the learner make meaning out of what we were doing and to see how any works that they may produce could be used for this research. When collecting the data, learners were informed that their work would form part of the study and that marks were awarded for their final product which was a report, of which one task, the reflective Blog, was used in this study to help understand the learner experience.

4.7 Conclusion

This chapter has provided details of the research design and justified the research stance and the methodological considerations including research techniques for data collection, and argued that the most appropriate methodology is the case study in order to answer the research question, which was argued to influence the choice of case study as the research strategy, and reflective Blogs, tutor observations and technology contributions to collect the data. Content analysis of the data was argued to be appropriate to derive categories and comments as illustrations of the impact on the learner of the tutor practice. The following chapter describes in detail how the methodology was put into practice as a method in this study.

Chapter 5 Method

Chapter 4 discussed and justified the research design, the methodological considerations, the data collection methods and the data analysis appropriate to answer the research questions. This chapter describes how the methodology was put into practice as a method, which began with study 1 which took place in the year 2005 and 2006, moving onto study 2 which took place in the year 2006 and 2007. In both studies (Doolan, 2006; 2007a; 2007b; 2007c) assessment was the key driver for learning and grounded in active, social, collaborative, community and situated learning critiqued in Chapter 2 and put into practice in Chapter 3. Each study is discussed in turn in this chapter following the study background and sampling strategy used in both studies with the intention of providing sufficient contextual information related to both studies.

5.1 The programme of study

The students in this study are studying on the Computing Unit programme, part of the Combined Modular Degree programme that was taught within the School of Computer Science at the University of Hertfordshire. This may be studied in various study patterns such as single Honours, Major, Twin and Minor.

The underlying philosophy of the study programme as specified in the programme specification (University of Hertfordshire, 2005) was that the

specific knowledge learners' gain is less important to them in the long term than their ability to continue to learn, to be adequate and confident communicators in the widest sense and to make an active and constructive contribution in their working environments. Such skills come under the heading of work-based skills (Marjanovic, 1999) and opportunities are available to learners on the programme to acquire such skills, as well as those of more technical aspects of the discipline.

The Minor module on offer on the Computing Unit programme of study is the Information Systems Development module, which supports the management of persistent data. Learners who choose this as a Minor option will study the Information Systems Development module alongside a range of modules in different subjects from across a range of disciplines at the university. It is considered important that learners who follow even the most minimal pattern of study through the programme (the Minor pattern) should gain a rounded picture of the process of system design, development and use, albeit within a limited context.

5.2 The module under study

The Information Systems Development module under study is delivered through the use of information systems case studies; the primary motive is to provide an insight into realistic company environments given that learners studying on this module do not have an industrial placement. An important learning objective is for learners to apply the principles and techniques of

system development in a team environment, thus fostering and developing collaborative working skills (University of Hertfordshire, 2005). The learners are also expected to use appropriate software engineering practices to make informed decisions about best approaches to an information system development. To promote collaboration, learners are encouraged along a continuum to move from problem identification through to implementation and evaluation processes fostered in the learning design (see Chapter 3) requiring collaborative decisions to pursue chosen approaches within the context of a collaborative working environment. In so doing, learners were expected to develop their skills in building computer-based, user-friendly information systems alongside transferable skills for the workplace.

5.3 Sampling strategy

Learners in both studies were chosen based on opportunistic sampling (Silverman 2000) and a pragmatic approach was adopted where sampling is determined by access (Stake 2000). I am the module tutor and the programme manager for the computing unit programme of study with access to the sample. The insider-outsider tensions (Hellawell, 2006) are illustrated in Table 4.1. For both studies the groups were chosen randomly from a list as allocated by the tutor. A number ranging from one to six was placed beside each individual student's name in alphabetical order on a list and the list was sorted by number. The groups were labelled numerically ranging from Group 1 and the students were provided with a group number. The majority of groups comprised six members. The group list comprising group

number and group member names was made available to students within a lecture where students were introduced to each other by the tutor and provided with activities to support group work. The group list was also accessible via the Wiki (see Chapter 3). Each group member was expected to participate and engage with the learning activities presented in 3.4.2 in Chapter 3 using the Wiki and face-to-face learning. The students were provided with all the relevant templates and learning materials required to undertake the group based assessment tasks. All tasks were based on the case study provided for the assessment (see 7.9Appendix B).

Students were expected to organise the division of labour bearing in mind that they would all receive the same mark for the group components of the assessment unless individual groups wished to negotiate this with the tutor as was made clear on the assignment specification.

5.4 Study 1 – exploratory

I undertook study 1 as an exploratory study in the academic year 2005 to 2006. This was followed by study 2 in the academic year 2006 and 2007 and is described in the following section. The intention of study 1 was to investigate the effectiveness of the design, development and application of a Wiki application in order to use an online learning environment to supplement class contact to support collaborative learning as detailed in Chapter 3. Study 1 also served to try out and test the methodology with a view to accepting or rejecting the research stance for inclusion in the second study in

the academic year 2006 to 2007 as the most appropriate means of answering the research questions, given the newness of the technology being adopted in designing the research strategy.

The tutor's practice was based on a blended learning framework as critiqued in section 2.4 in Chapter 2 and put into practice in Chapter 3. Study 1 *emphasised the need to consider the role of the tutor in designing and implementing an online learning community of undergraduate computing students through the use of a Wiki technology intended to help answer the research questions.*

5.4.1 Participants

Ninety-six learners took part in study 1 and sixty learners in study 2. The background information on the respondents is presented in Table 5.1 and Table 5.2. The students were put into groups of six for this study randomly to undertake the group-based assessment when studying on the Information Systems Development module. There were ten groups of six under study.

5.4.2 Methods

Three data collection methods were used in this study. Qualitative data was derived from learner reflective Blogs and tutor observations as critiqued in section 4.4.2 and 4.4.1 in Chapter 4. Additionally, a statistical counter was used to measure the number of hits or page loads made to the Wiki by learners over the duration of the assessment. Statistical counters are online

statistical packages that may be integrated into web pages. They keep a count of the number of times a web page is loaded. In this study statistical counters were integrated into the homepage of the Wiki and into the sixteen group spaces in the pilot study. These were useful in the exploratory study to measure the total number of hits (page loads) to the Wiki home page and private group spaces. This measure was used to identify the learner engagement and study usage patterns. However, the outcome should be interpreted with caution as the statistical counter counts the number of times a page is loaded; this means that each time the page is refreshed, for example by pressing the F5 key on the keyboard, this adds to the count. A literature search on the use of statistical counters in similar studies revealed nothing. Additionally no in-depth insights were gained into the learner experience using this technique. For this reason this was deemed unsuitable to use in the second study, particularly given the second study focus was to gain an understanding of the perception of learner experience, their attitudes and feedback relating to the use of the Wiki; therefore, the statistical measure was not used. The measures obtained in the exploratory study initially were useful to the tutor in determining whether or not learners were using the Wiki after it was made available to them as the statistical counter revealed some interesting study patterns whilst using the Wiki.

5.4.3 Data analysis

Data analysis was undertaken on the learner reflective Blogs and tutor observations critiqued in section 4.4.1 and 4.4.2 in Chapter 4. In study 1 a

Cohen Kappa inter-reliability test (Fleiss, 1981) was undertaken on the positive and negative comments derived from the learner reflective Blogs. This was intended to consider objectivity in the data analysis. The inter-rater reliability technique rates show how different coders produce the same results when the same body of material is examined (Silverman, 2000). This was not taken forward into study 2 as this was deemed unsuitable given the second study focus was to gain an understanding of the perception of learner experience to a subjective and interpretive stance appropriate to answering the research questions as critiqued in section 4.2 in Chapter 4. It was not intended to persuade others of the objectivity of this study through science, logic and evidence (Golden-Biddle and Locke, 1997). To increase the worthiness of the research Stake, (2000) suggests using multiple perspectives to triangulate data from different sources. Triangulation is critiqued in section 4.3.2 in Chapter 4.

This section describes the process of analysis of the learner reflective Blogs; this is followed by a section presenting the analysis of the tutor observations.

The sixteen groups of learners comprising six members each were required to complete learner reflective Blogs as an assessed task. The Blogs were analysed and coded based on specific topics raised in the Blogs and in their open nature.

Content analysis as described in section 4.4.3 in Chapter 4 was undertaken on the reflective Blogs. The unit for analysis in this study was a phrase that represented a student quote and documented in their own words, for

example “to have connections”. The categories derived from the data are P-O (People-Oriented) and T-O (Task-Oriented). A sample of People-Oriented and Task-Oriented comments is shown in Table 5.1 and Table 5.2 respectively.

Student No.	People Oriented
1	all working together
1	we share information
2	All members try 100%
2	to get to know each other
3	Interaction between the group
3	the ability of work together
3	each member of the group to be responsible, reliable
3	great way of forming a team
3	discussing ideas
3	you can trust each other and rely on that person
3	may form strong friendships
4	everyone had different skills that they brought
4	group members respective of each other’s needs
4	they still made an effort to work around any obstacles
4	We all have jobs to do and rules and regulations to adhere to
5	when all members of the group participate

5	by putting forward their ideas
5	contributing by answering questions that have been asked
5	Individually do their own research on a topic
5	knowing what is being said in the group
5	turning up for meetings
5	knowing who the group members are

Table 5.1: List of extracts from reflective Blogs show people-oriented learners

Student No.	Task- Oriented
1	to work together on tasks
1	to fulfil requirements
2	to complete tasks
2	to review all the tasks
2	to complete the set tasks
2	to make sure we all turned up to meeting
2	to make sure we understood what took place
3	to work together on assignment
3	to discuss and analyse
3	to produce relevant issues as well as results
3	to communicate well and efficiently about tasks
3	to contribute various ideas and opinions on tasks

3	it generates ideas as a group
3	to communicate with other members on the assignment
4	to get together to complete a task

Table 5.2: List of extracts from reflective Blogs show task-oriented learners

To measure learner attitude in the reflective Blogs, a sample of two categories were chosen P (a positive response), N (a Negative response). A sample of positive and negative comments is shown in Table 5.3 and Table 5.4 respectively.

Student No.	Positive Comments
1	work on tasks at any time
1	within the comforts of their own homes
1	find it easier to work remotely as they are shy
1	group could continue with the work if they were not in a meeting
2	each member could add and remove the content in their own time
2	face to face could lead to members going off topic compared to online is very unlikely to happen
2	it reduces travel time and expenses
2	reduces the amount of information a third less words per unit
3	times where certain individuals would not be able to meet up online enables the whole group to interact with each other
3	interact with each other in their own time

3	allows fellow group members to share information and ideas
3	allows the individual to analyse and study all data that has been put up
3	data that has been put up clearly and easily unlike face to face where may not understand a fellow members handwriting
3	allows the group to understand all the information issues and all topics discussed
3	clear and easy to follow information on screen
3	access from almost anywhere, using mobile phones, laptops
4	great for group members to come together
4	communicate and collaborate by posting documents and tasks

Table 5.3: List of extracts from reflective Blogs show positive learner comments

Student No.	Negative Comments
1	other members misinterpret what has been written
1	members can get annoyed if they rely on someone for work
1	ideas can be lost and replies can be days later
2	not being able to see the other person
2	material may look different in different browsers
2	more than one person could reply to a topic which lead to confusion
2	you could be the only one online so help is limited
2	the conversation flow is easier face to face online responses could be

	parallel
3	certain members of group may "sit back" and rely on fellow members
3	extra work load causing stress and tension amongst group
4	we all prefer to meet face to face that way you get a feel for what the person is like
4	a lack of physical communication
5	can lead to misunderstanding within the group
5	when arrangements are made not everyone will be available
5	all group members will not have access to the internet
5	if you do not save regular as you are doing your work it does not save and shows an error message meaning we had to start over again
6	technology can easily breakdown therefore it will be difficult to communicate ideas and so slows everything down
11	there can be misunderstandings where the plain text we see online is taken "out-of-context"
12	lack of true response, facial expression
13	no visual audio feedback people may take things the wrong way

Table 5.4: List of extracts from reflective Blogs show negative learner comments

Student attitude was rated and given a number between one and ten, using a Likert type scale where one represented poor, five average and ten excellent. This measure was based on my past experience (Doolan, 2004; Doolan and Barker, 2005). This data analysis was carried out by my own hand in order to get a feel for the data and to explore the true meaning as

discussed in section 4.4.3. The category codes were written on the student text and then the categories and derived quotes from the student text were typed into Excel. A sample of attitudinal measures is shown in Table 5.5.

Table 5.5 shows the group number, the student anonymity number, the number of positive and negative comments derived from the analysis of the learner’s reflective Blog. This was indicated on the text within the Blog by using a **P** which represented a positive comment, conversely **N** represented a negative comment.

Group No	Anon No	Total Positive	Total Negative
1	S1	11	9
1	S2	21	5
1	S3	13	11
1	S4	15	2
1	S5	16	9
1	S6	16	9

Table 5.5: Learner attitude ratings derived from reflective Blogs

5.4.3.1 Inter-rater reliability

To check for researcher bias in selecting positive and negative comments an inter-rater reliability test Cohen Kappa (Fleiss, 1980) was performed. It was intended to provide a level of confidence in the data. The two categories P and N were chosen as the rating of student attitude was dependent on these,

hence it was important to ensure that the data derived from the content analysis was reliable. The process was as follows:

Using the Microsoft Excel spread sheet application (Microsoft Corporation, 2010) every positive comment was given a number between one and four and sorted by number, a total of twenty-three positive comments were selected (all number four). Every negative comment was given a number from one to four and sorted by number, a total of thirteen negative comments were selected (all number four). These thirty-six student quotes were merged and mixed in a file and sent for independent analysis. The independent researcher was asked to tick the relevant column P for Positive, N for Negative and DK for don't know.

In order to address inter coder and intra coder reliability, the above mentioned strategy was followed individually and then carried out by an independent researcher. The results in the form of an agreement table are shown in Table 5.6.

Values highlighted in bold in the table show agreement between the two individual researchers. The table shows how the researchers agreed on positive and negative comments elicited from the students work.

		Researcher 1		
		Pos	Neg	DK
Researcher 2	Pos	20	1	0
	Neg	0	10	0
	DK	3	3	1

Table 5.6: Agreement matrix

The reliability of these categorisations is tested through Cohen's Kappa (k) statistic where agreement between the values of two raters (rating the same student quotes) is measured. The result is shown Table 5.7

	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Measure of Agreement Kappa	.746	.094	5.863	.000
N of Valid Cases	36			

a. Not assuming the null hypothesis
 b. using the asymptotic standard error assuming the null hypothesis

Table 5.7: Cohen's Kappa measure of agreement

As Table 5.7 illustrates, the Measure of Agreement k is above .7 which shows a reliable agreement (Vogt, 1999 in Beecham, 2003) thus the value in the table .746 shows that the problem classification is reliable in this study. The significant value < 0.01 shows that this did not occur by chance alone.

The full test is provided in 7.9Appendix D. The next section presents the data analysis undertaken on the tutor observations and reflections.

5.4.4 Data analysis - tutor observations and reflections

Content analysis as described in section 4.4.3 in Chapter 4 was undertaken on the tutor observations and reflections that were captured in a journal on a daily basis (see section 4.4.1). The unit for analysis was a phrase which represented a tutor quote and documented in the tutor’s own words, for example *“promote deep learning through learning designs “and “learners actively construct new ideas through collaborative activities and/or through dialogue”*. Categories derived from the data are **Approach taken** and **Learning**. A sample of comments is shown in Table 5.8 and Table 5.9 respectively.

Tutor Comments – reflections on the approach taken by the tutor
Upfront investment in time and resources
Technical competencies
Assessment design active learner engagement
Promote learner engagement through learning design
Promote deep learning through learning design
Learning design underpinned by learning theories and concepts
Understand ‘how’ and ‘why’ to use the learning theories
Learners perceived as a ‘valuable’ resource’
Learner is co-producer of learning resources
Establish culture, prepare learners offline and online
Establishing, developing and implementing a structure ‘blend’ in learning
Communicate clear expectations i.e. respect, share, scholarly practice

Planning for 'learning', promoting learner 'participation'
Provide clear guidance on role i.e. set up learning design and 'step back'
Help students to make sense of learning design i.e. tutor support
Support and nurture student relationships i.e. group commitment
'Align' learning outcomes with the teaching and the assessment design
Choose technology that is 'organic' co-author, collaborate
Testing, trying out, then implementing designs based on feedback
Evaluate pre practice, in practice and after practice – learner-centric
Gain support from colleagues and learners alike (wealth of experience)

Table 5.8: Approach taken - tutor comments derived from the tutors' reflective journal

Tutor Comments – tutor observations of learning based on learner contributions in the Wiki
student-student dialogue, empowering learners, personal meaning, taking lead in learning process, direction of learning
learners actively construct new ideas through collaborative activities and/or through dialogue
learning activities are encouraging participation, collaboration, share ideas
peer review and evaluation between group members and across groups
respect for each other, our different abilities and diversity in learning
engagement protocols help students to take responsibility for themselves and their own learning whilst being sensitive to the needs of others in their group
groups setting clear goals, learning objectives, collaborative learning
sharing publications, images i.e. Bart Simpson, photos of students
dividing tasks between group members
some group members taking the lead and allocating tasks
students showing commitment to their group, when, where to meet
students exchanging details i.e. email, mobile numbers.
groups creating own pages, links - structure
students sharing assessment details i.e. spec linked within group area
<i>students actively engaged with the technology alongside traditional face-to-face meetings and class contact</i>
some groups devised task completion schedules
colour codes to identify each other
peer to peer support – supporting those who are unsure
Posting questions students are stuck on
attach documents, presentations, images, journals and web links
hyperlinks and simple text for creating new pages and cross links between pages

Table 5.9: Learning - tutor comments derived from the tutors' reflective journal

5.4.5 Discussion of results on Study 1

Study 1 provided an opportunity to try out and test the research methods for data collection and analysis with a view to accepting and/or rejecting these. Two data gathering methods were taken forward to study 2: the learner reflective Blogs and tutor observations. Additionally content analysis was taken forward into study 2 for the purposes of data analysis. An outcome of study 1 was a focus on a qualitative methodological stance, one that is subjective and interpretive, using a case study as the research strategy. These methodological considerations are justified in section 4.2 and 4.3 in Chapter 4.

Additionally, study 2 served as the basis to try out and test the learning, teaching and assessment design that included the learning materials and the Wiki application (see Chapter 3). As a consequence changes were made to the design of the Wiki, which was adapted to include audio (podcast) and video linked to Wiki contributions. In this way, it was intended to provide additional opportunities for the collaborative experience. These are discussed in Chapter 3.

The role of the tutor was found to be a key factor in study 1 in ensuring student ownership and engagement, and in fostering a learning community. It was found that the learning activities set by the tutor should encourage this by designing activities for completion individually and in groups as an integral part of the overall module assessment (Doolan, 2006). Indeed, the role of the tutor was found to be so paramount, the study was repeated for a second year with a revised role of the tutor learning from study 1.

This work also highlighted the importance of the blend in combining face-to-face and online learning which should maximise on the pedagogic opportunities afforded by both approaches.

Study 1 explored the effectiveness of concepts and theories in the conceptual framework in Chapter 2 on pedagogical practice and helped to justify many of the assumptions made in the design of the Wiki and the face-to-face learning environments and the associated learning materials used in this thesis (see Chapter 3), particularly relating to active, social, collaborative, community and situated learning theories which are critiqued in Chapter 2. Study 1 also showed that the role of the tutor in setting up, developing and managing a collaborative Wiki learning environment is best supported by social constructivism (Vygotsky, 1978), participation and a sense of belonging (Wenger, 1998). Additionally, it is underpinned by the principles of good practice (Chickering and Gamson, 1987) in design for learning that set clear expectations, reciprocity and dialogue in the pedagogical practice. The importance of the tutor in designing a mix or 'blend' between the face-to-face and Wiki learning environment that supported collaboration, interaction, engagement, reciprocity and participation amongst learners was also shown.

Results of content analysis of learner reflective Blogs used to gain insights into the learner experience in 2006 showed how the *"students actively engage with the technology alongside traditional face-to-face meetings and class contact"* (Doolan et al, 2006: 14). Quantitative evidence captured using a statistical counter in this work showed 35,599 hits or page loads to the Wiki

over a four week period and provided an indication of the students' study patterns and usage level, providing an insight that students were engaged with the Wiki technology and furthermore, how the technology supported participation and interaction amongst learners whilst they were engaged in group based assessment.

Lessons learnt through undertaking study 1 resulted in a Staff and Educational Development Association guide for tutors on setting up online collaborative learning groups using Wiki technology (Doolan, 2007b) and a publication on the use of Wiki as a means of developing learner competencies in an attempt to bridge the gap between IT profession and academia for the British Computer Society (Doolan, 2006c). Finally it was reported in the Times Higher (Doolan, 2007c) as an example of adapting curriculum and taking a risk with Wiki.

In summary, study 1 provided insights into the learner experience, their attitude and feedback relating to the Wiki designed by the tutor and used to support group-based assessment. Results showed that Wiki technology was able to support group work. However, similar to group work without technology not all learners equally participated in the group work experience. Results also showed that learners perceived the Wiki learning environment as a community to support them as 'people' and the achievement of 'tasks'. 'People' aspects of community development included "*to find someone who knows the answer and is willing to help you*" (Doolan, 2007:81). 'Task' aspects included "*to ensure the successful completion of the tasks*".

This work also demonstrated the need for learners to feel a sense of belonging to a community “*so if I put my idea forward in text, image or diagram and am not correct someone else in our group can edit it*” (Doolan, 2007:81). This was particularly evident in those learners who were ‘people’ oriented as opposed to ‘task’ oriented. The results showed the importance for ‘task’ oriented learners of having the opportunity to manage their learning and learning environment.

The contribution to the research in this thesis through the exploratory study, therefore, was the design and development of two learning environments (online and face-to-face) and the associated learning materials (Doolan et al., 2006; Doolan, 2006; 2007a; 2007b; 2007c) as presented in Chapter 3.

Study 1, therefore, assisted me in the development of ideas; the outcome is the crystallisation of research techniques and strategy. By testing, accepting, and rejecting research techniques, the most appropriate research techniques (necessary in answering the research question and informing the research strategy in this thesis) were made clear. The second study is described in the following section.

5.5 Study 2

In the context of the research question, study 2 was undertaken in the academic year 2006 to 2007. The sampling strategy is discussed in section 5.3 the methods used included reflective Blogs and tutor observations and were supported using contributions made by the learners to the Wiki. These

are critiqued in Chapter 4 in section 4.4.1 and 4.4.2 respectively. Study 2 is intended to build on and validate study 1. Therefore, this study aims to further clarify the role of the tutor in supporting student learning through the use of a Wiki application to support class-based learning. Additionally, this study validates the learning, teaching and assessment design and practice presented in Chapter 3 on how this role can be enacted as this area of practice develops further. This includes the learning design and pedagogy.

In study 2 the tutor spent time 'upfront' becoming familiar with a range of technologies such as video, and podcasts (audio) to present the core learning task (Chapter 3) in different formats including paper. This was as a direct response to feedback from learners in the first year of the study and in keeping with the collaborative/community ethos in practice and a dialogue with learners. In response to learner feedback the assessment design reflected the changes in study 2 in the Wiki design based on suggestions and learner feedback relating to its use to support the collaborative experience.

Although learners reported positively for example that, a Wiki could

"provide confidence to the individual to effectively contribute their ideas" (S6) and *"so if I put my idea forward either in text, images or diagram and am not correct someone else in our group can edit it"* (S9) learners also reported there was a lack of visual cues when working and relating with others - *"no visual audio feedback people may take things the wrong way"* (S13) and *"lack of true response, facial expression"* (S12). Therefore, in this study learners

were given a choice in selecting appropriate media to complete their individual and group tasks and to present these as a group, such as jointly edited video and podcasts linked to Wiki contributions.

This approach offered learners choice as to how they personalise their own learning to present the associated tasks in a more enriched way using different technologies. As a group, they were able to select the tools and media most appropriate to their needs and to allocate specific tasks to individual group members, for example video and podcast recording, editing responsibilities, mixing of different media etc. Individual and group contributions to the Wiki learning environment were supported by the use of an individually assessed Blog reflection task (see section 3.4.2.5 in Chapter 3).

5.5.1 Participants

The sample for the analysis is a cohort of 60 learners who took part in the research study. The majority of learners had progressed from the first year of the programme at the University of Hertfordshire, with a minority being direct entrants from the first year of the programme at a local regional college. The background information of the respondents was presented Table 3.2 in section 3.2. The students were put into groups of six for this study randomly to undertake the group-based assessment when studying on the Information Systems Development module. There were ten groups of six under study.

5.6 Data analysis

Of the sixty students registered on the module five learners did not submit the reflective Blog as part of the assessed task; however they did submit the group based assessment. Therefore, analysis of the data was completed on fifty-five learner Blogs submitted as part of an assessed task (see 3.4.2.5 in Chapter 3).

5.6.1 Content analysis

The content analysis procedure on the fifty-five learner Blogs involved “a *systematic reading of a body of texts*” (Krippendorff, 2004”:3) which is described as “*fundamentally a qualitative process*”(Krippendorff, 2004”:20) a justification of the method chosen for data analysis is provided in section 4.4.3 and applied to the data as follows:

1. On the first pass through the data the researcher was consciously reading, scouring the texts to become familiar with the data content.
2. A second and third pass through the data comprised of using colours and letters to link data with categories.
3. The data used was a unit of text; a phrase, a sentence or multiple sentences such as “*The phone interview was designed...*”
4. The categories were colour coded and letters were used such as P and N reflecting Positive and Negative respectively. The categories are provided in Table 5.10.

Category	Description
<i>Learning</i>	Approaches (Process) to learning i.e. rules of engagement, working practices, enabling learning, negotiations, shared understandings, meanings
<i>Technology</i>	Uses, types, (those provided in study and not provided in study)
<i>Community</i>	Task-Oriented, People-Oriented, forming relationships
<i>Positive</i>	Attitude towards group work, technology, tutor practice
<i>Negative</i>	Attitude towards group work, technology, tutor practice

Table 5.10: Matrix of categories

Texts studied during content analysis in the reflective Blogs were placed into categories that made sense to the researcher relating to the research questions (Krippendorff, 2004:24) and based around the three key research themes **tutor, technology, and collaborative learning** presented in 1.7 . The units of text (phrases, sentences and multiple sentences) were perceived as learner comments and input into an Excel worksheet in each category for data analysis and data management in this study. In this way, inferences could be made from the texts relating to the research question and based around the three key themes of the research **tutor, technology** and **collaborative** learning. The comments derived were based on Krippendorff's (2004: 25) view that *"inferences are merely more systematic, explicitly informed, and (ideally) verifiable than what ordinary readers do with texts"*.

5.6.2 Three learners - in-depth insights

In addition to content analysis of the fifty-five learner Blogs, to capture insights into the perception of the 'single' learner perception of the collaborative experience whilst working collaboratively within a group, samples of three individual Blogs were selected. These were representative of a high, mid and low mark awarded to learners for the group report. This is based on tried and tested methods, gained through previous experiences of using reflective Blogs as a research technique when evaluating technology use in group-based assessment (Doolan, 2004; Doolan & Barker, 2005). The findings (discussed in Chapter 6) of each single learner experience relating to the collaborative experience are presented alongside a fictitious student name, mark awarded, and a summary of the learners' perception of their experience, derived from the individual learners reflective Blog. The criterion for choosing student reflections is based around the three key themes of the research **tutor**, **technology** and **collaborative learning** introduced in section 1.7 in 0 and based on:

1. The overall depth of learner reflections, usually reflected by a higher mark, and how the learner gained from the collaborative experience. This is personified by the comments of Mary, a mature student with family commitments, studying in the business school in addition to computer science. Mary was a student who was new to almost every form of media and technology used. Mary is a good example of a student who showed real enthusiasm as well as thoughtful reflection. Mary was chosen as the high performing student, gaining 97%,

obtaining the highest grade across the cohort of learners and within her group.

2. An interesting or different point of view is personified by the comments of Jack who, on the whole, found using alternative media and technology something of a strain. His comments were the strongest contrast to those of Mary, highlighting some of the negative feelings online working can elicit. Jack obtained the highest score within the mid performing group; that of 49%
3. A good grasp of the learning outcomes and of the concept of undertaking the learning activities online was demonstrated by the comments of Henry in his individual reflective Blog. Henry also showed some creative flare in a photographic collage of his experiences. Henry obtained 39%, the highest mark of the lowest performing group. However, Henry and his group failed to understand the user requirements and as a result provided inaccurate requirements for the computer system. This had an impact on the remaining tasks. For example, there were inaccuracies in the software engineering solutions provided by Henry and his group, which resulted in a low mark.

This chapter described study 1, an exploratory study that took place in the year 2005 and 2006 to investigate the effectiveness of the design, development and application of a Wiki in order to use it as an online learning

environment to supplement class contact. Study 1 also served to test and try out the most appropriate means to answer the research questions, given the newness of the technology being adopted in designing the research strategy. Study 2 built on study 1 and took place in the year 2006 and 2007. In both studies, assessment was the key driver for learning and grounded in active, social, collaborative, community and situated learning theories critiqued in Chapter 2 and underpinning the development of the learning design in Chapter 3. Both studies showed how the methodology was put into practice as a method. The following chapter presents the findings and a discussion of the impact on the learner experience and the role of the tutor.

Chapter 6 Findings and discussion

This chapter answers the research question by firstly addressing sub question one:

What is the role of the tutor in technology supported collaborative learning?

This is intended to bring clarity to, and provide evidence of, the impact on the role of the tutor in supporting student learning through the implementation of a learning 'blend' comprising a Wiki and a class-based setting in addition to the university MLE. This was evidenced by using the pedagogical models critiqued in the conceptual framework in Chapter 2 and demonstrating their use in the tutor practice in Chapter 3. It was shown, in Chapter 3, how the tutor practice combined the concepts of learner-centric, sociocultural and dialogic perspectives on collaborative learning and technology. The argument was made that when technology is used in this way it is a learning resource to support collaborative learning through assessment.

Secondly, this chapter focuses on sub question two:

What is the learner experience of collaborative learning through technology?

The evidence presents insights into the learner experience relating to their use of the technologies provided, namely a Wiki and the university MLE, especially through the use of Blogs as used in this study to capture students' reflections

on the experience of collaborative learning. Additionally, the discussion facilities were used to extend the class-based dialogue and supplement the class-based setting. Each sub question is addressed in the context of this research study in turn.

The questions are addressed by a discussion of the findings of both studies. Firstly, the findings of study 1, which took place in the academic year in 2005 – 2006 with a cohort of ninety-six second year students studying an information systems module on the second year programme of study. These are followed by the findings of study 2 which took place in 2006 – 2007 with a cohort of sixty learners studying on the same programme and undertaking the same module. Findings are presented around the three key research themes: **tutor, technology and collaborative learning** presented in 0 in order to answer the research question. It follows, then, that this research focused on supporting collaborative learning through assessment and therefore does not focus on assessment per se.

1. *What is the role of the tutor in technology supported collaborative learning?*

6.1 Understanding the role of the tutor

This section discusses the findings based around the key research theme; the **tutor**.

6.1.1 Developing and implementing a structure for the 'blend'

The tutor role was critiqued in study 1 and based on first-hand experiences, observations, reflections and interpretations of the development of the Wiki and face-to-face learning environment discussed in Chapter 3. Study 1 showed the role of the tutor in establishing, developing and implementing a structure for the 'blend' between a Wiki learning environment, a class based setting and the associated learning materials. Related to the adaptation of learning and teaching practice as discussed in Chapter 3 (and practising the concepts of learner-centric, sociocultural and dialogic perspectives on collaborative learning) is an awareness of learning and teaching practice, stimulating tutor reflections and triggering appropriate learner support. For example, in a lecture and through other mediums, the tutor constantly sought feedback on using the online facilities such as the Wiki and the discussion forum housed on the MLE and class-based practice to feed forward into online and class-based practice. To give another example, at the beginning of a lecture learners were prompted by the tutor to write one good thing and one not so good thing about practice thus far. The tutor provided a 'feedback box' for learners to post comments, compliments, and concerns on any aspect of practice. This was continuous and on-going from the beginning of the module, thus providing opportunities for self-awareness on learning and

teaching practice, highlighting gaps in learner knowledge and providing an opportunity to respond to learner needs at the same time, reflecting on and adapting practice as necessary.

6.1.2 Planning for 'learning'

The tutor role as shown in Chapter 3 placed importance on planning for 'learning' and helping students to make sense of this in the learning design by 'aligning' learning outcomes with the teaching and the assessment design. This was designed into the 'blend' between the Wiki and the class based learning environments to support the five assessed learning activities in the context of collaborative learning. An important outcome of study 1 was the need to understand the role of the tutor with 'how' and 'why' to use the learning theories and concepts in Chapter 2 in the development of the Wiki and the associated materials. The outcome of the design, development and implementation of both online and face-to-face learning underpinned by the learning theories and concepts in Chapter 2 and detailed in practice in Chapter 3 were used as the input to and influence for the design decisions in study 2. The practice in study 2 clarified further and validated the role of the **tutor, technology and collaborative learning** practices and the outcomes of that practice and related design of the Wiki and face-to-face learning designs and the associated learning materials used in study 1 to support the collaborative experience.

6.1.3 Lessons learnt from study 1

As a consequence the design of the Wiki trialled in study 1 was used in study 2 with some alterations. The alterations were based on lessons learnt from study 1 relating to the design of an online learning environment. Additionally, changes were made to the assessment design and practice and the associated learning materials, based on learner and colleague feedback related to the phase one study. Further amendments were made based on the new intake in the year 2006 – 2007, a cohort of sixty learners studying on the Information Systems module.

An important outcome of study 1 was the realisation that through undertaking the study itself, the Wiki set up by the tutor was complex, requiring a level of technical skill and ‘interface’ design knowledge. Also, the necessity of setting aside much ‘upfront’ time was realised, given the time and effort in setting up, implementing and managing a Wiki, given that the Wiki was intended to form the basis for the main study and, crucially, was intended to be a ‘valuable repository for learning’. In line with the ethos held of learner as a ‘valuable resource’ the ‘upfront’ investment was deemed to be necessary. However, this investment impacts on the tutor’s time and resources.

Since the development of this Wiki learning environment in 2005-2006, Wikis are now embedded within institutional resources such as the university MLEs and VLEs such as Blackboard. With this in mind, although there is less of a need for ‘technical’ knowledge, the outcome of study 1 shows that there remains a need to apply the underlying learning theories and concepts when designing online and face-to-face learning environments. Crucially, the

design must be underpinned by a conceptual framework to promote learning in such a way that the learning activities set by the tutor are designed to promote active and participatory learner behaviours. Study 1 has shown the importance of considering ways to create the conditions to support learners' collaborative experience, especially in a blended learning context. The complexities of managing both face-to-face and online learning environments were realised through study 1.

Study 1 also showed ways to structure and design a 'blend' of two learning environments comprising a face-to-face and an online learning environment. This was achieved through piloting the 'mix' or 'blend' between the face-to-face and Wiki learning environments. Table 6.1 summarises the outputs based on the tutor experiences, observations and reflections as detailed in Chapter 5.

Tutor Comments on Role
Upfront investment in time and resources
Technical competencies
Assessment design active learner engagement
Promote learner engagement and technology
Promote Deep Learning through learning designs
Learning design underpinned by learning theories and concepts
Understand 'how' and 'why' to use the learning theories
Learners perceived as a 'valuable' resource'
Learner is co-producer of learning resources
Establish culture, prepare learners offline and online
Establishing, developing and implementing a structure 'blend' in learning
Communicate clear expectations i.e. respect, share, scholarly practice

Planning for 'learning' promoting learner 'participation'
Provide clear guidance on role i.e. set up learning design and 'step back'
Help students to make sense of learning design i.e. tutor support
Support and nurture student relationships i.e. group commitment
'Align' learning outcomes with the teaching and the assessment design
Choose technology that is 'organic' co-author, collaborate
Testing, trying out, then implementing designs based on feedback
Evaluate pre practice, in practice and after practice – learner-centric
Gain support from colleagues and learners alike (wealth of experience)

Table 6.1: Tutor Role – strategies to support collaborative learning extracts of tutor reflections

The role of the tutor was found to be a key factor in ensuring student ownership and engagement, and in fostering a learning community. In this work it was found that the learning activities set by the tutor should encourage this by designing activities for completion individually and in groups as an integral part of the overall module assessment (see Chapter 3). This was evident from the observations made by the tutor and the impact on the learner experience in the findings of the learner reflective Blogs discussed in section 6.3 and evident in the findings of the in-depth individual learner reflections in section 6.3.10. Indeed, the role of the tutor was found to be so paramount, the study was repeated for a second year with a revised role of the tutor learning from study 1. The role of the tutor in practice, designing and implementing the Wiki and face-to-face learning environment and associated learning materials was discussed in Chapter 3. Chapter 3 showed that the role of the tutor in setting up, developing and managing a

collaborative Wiki learning environment is best supported by social learning and participation theories.

6.1.4 Set clear expectations, reciprocity and participation

Chapter 3 suggested that the tutor, when designing the learning activities, must set clear expectations which incorporate reciprocity and dialogue in the learning design and encourages this amongst learners. The importance of the tutor in designing a mix or 'blend' between the face-to-face and Wiki learning environment, supporting collaboration, interaction, engagement, reciprocity and participation amongst learners, was also shown to be key in the design and implementation of the blend of learning in Study 1 as the effectiveness of the concepts and theories in the conceptual framework in Chapter 2 on pedagogical practice were put into practice (see Chapter 3), helping to justify many of the assumptions made in the design of the Wiki and the face-to-face learning environments and associated learning materials used in this thesis.

Study 1 introduced and critiqued the technology including Wiki and a discussion forum, the learning design, and both learning environments: technological and face-to-face. The contribution to the research in this thesis through study 1 therefore, was the design and development of two learning environments, online and face-to-face and the associated learning materials (Doolan et al, 2006; Doolan, 2006; 2007a; 2007b; 2007c), highlighting the

importance of the role of the tutor in supporting collaborative learning through assessment using technology as detailed in Chapter 3.

6.1.5 Progress made by individuals and groups

The tutor valued the functionality that a Wiki affords to monitor and view student progression as they undertook the learning activities. Although in this study the tutor did not intervene in the Wiki learning experience itself, the tutor was able to use some of these insights to take 'forward' into the classroom. For example, to clarify misconceptions and to 'nudge', praise and motivate learners. In this way, the tutor was helped to continue the ethos of 'community' and collaborative learning 'blended' both in class and online. The tracking features provided in a Wiki were invaluable in allowing the tutor to compare versions side by side. In this way, the tutor was visibly provided with an indication of progress made by individuals and groups. Through this mechanism it was possible to see which learners contributed to the group work, how much and when, as a Wiki stores names, dates and times of access. Although this was used with 'caution' this did provide an indication of who was doing what and when. This was compared against the usage patterns of group space usage and the overall usage patterns of the statistical counters as shown in Figure 6.2. These were especially useful when there were group disagreements (of which there was one out of the sixteen groups) in the collaborative experience. From the students' point of view, they made known to the tutor that they were content that this 'monitoring' facility was available to the tutor.

It was found by the tutor that the functionality of a Wiki helped with tutor observations and monitoring the impact of the Wiki on the collaborative learning experience, as a Wiki keeps track of changes. As a consequence the tutor observed how the different learner groups set up and used their learning environment. This section presented the findings based around the first of the three key research themes: the **tutor**. The following sections present and discuss the impact of the learner experience as derived from the learner reflective Blogs and illustrated using Wiki contributions made by learners. Each section is presented around the remaining two key research themes: **technology** and **collaborative learning** respectively.

1. *What is the learner experience of collaborative learning through technology?*

6.2 Technology and Impact on Learner

This section discusses the findings based around the key research theme **technology**.

6.2.1 Learners set up learning environment

This section uses an example of a group who decided to use colours within their 'private' group space within the Wiki to identify different group members' contributions to the Wiki whilst engaged in collaborative learning as shown in Figure 6.3. Figure 6.3 shows how this group designed a Wiki page for discussions relating to the five learning activities set by the tutor in section 3.4.2 in Chapter 3.

Others groups identified themselves using avatars and cartoons and used the whole host of facilities provided by the Wiki in various ways. For example, learners in Group 11 decided to structure their own learning environment using hyperlinks to internal pages such as the assessment page which housed the information relating to the assessment and associated materials as shown in Figure 3.3. In addition, Group 11 learners, in their learning structure, used hyperlinks to external links such as websites and used these resources for research purposes, bringing these resources back into their group space and sharing these resources with other group members in their private group spaces shown in Figure 6.1. Additionally the majority of learners' shared resources across groups to the designated communal area in the Wiki.

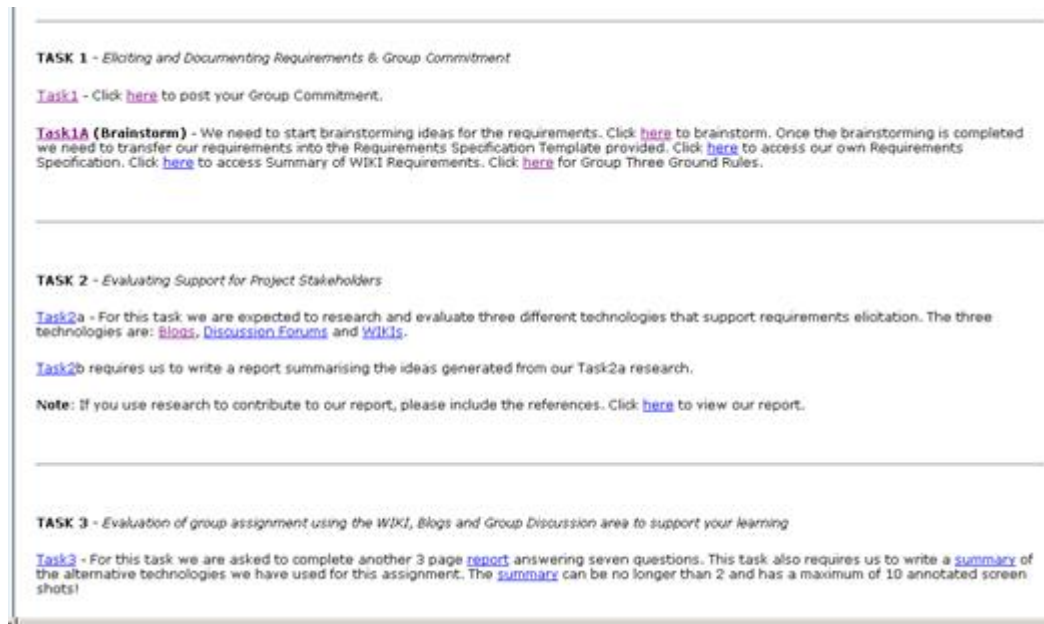


Figure 6.1: Structuring own learning environment – private group space in Wiki

In Figure 6.1 Group 11 learners chose to set out their own learning environment using hyperlinks to other pages. The majority of groups attached documents in addition to jointly creating Wiki pages and using the comments feature provided in Wiki(similar to the commenting feature on a Blog).Through the tutor observations, there was evidence of progressive construction of knowledge amongst learners via scaffolding as learners shared ideas and jointly solved problems, supporting each other in the completion of tasks by nudging along other learners.

6.2.2 Learners use the Wiki

Through the tutor design, development and implementation of a Wiki learning environment and through the set learning activities detailed in Chapter 3 the

tutor promoted learner engagement with technology. The statistical counters critiqued in Chapter 5 were intended to provide an indication of students' usage of the Wiki technology and thereby provided quantitative data in study 1 in the year 2005 – 2006. As discussed in Chapter 5, the statistical counters were integrated into the homepage of the Wiki (see Figure 3.2 in Chapter 3) and into the sixteen group spaces. These measured the total number of hits (page loads) to the Wiki home page and private group spaces whilst learners were using the Wiki (whilst undertaking the assessed learning activities through the collaborative experience detailed in Chapter 3). The statistical counter measure was learner usage of the Wiki and provided an indication of study usage patterns based on the statistical counts made to the Wiki homepage as shown in Figure 6.2.

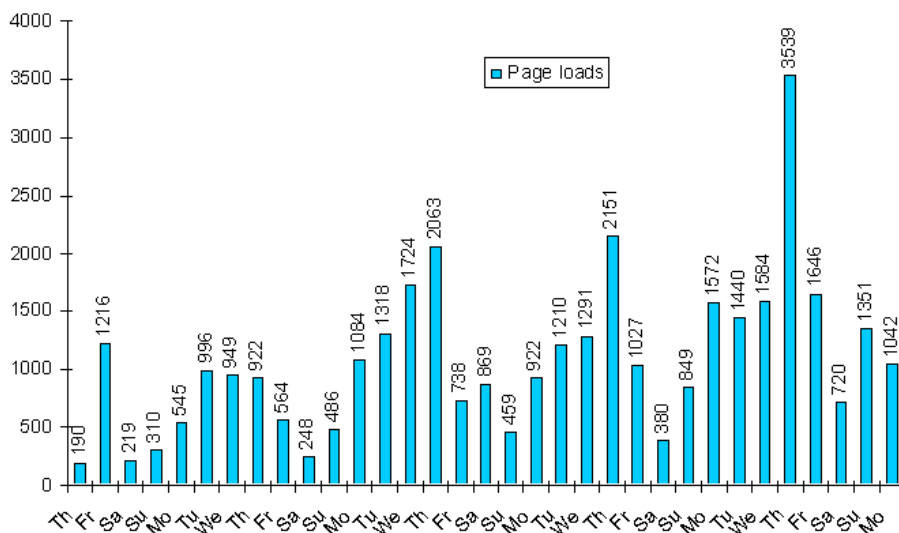


Figure 6.2: Learner usage over the duration of the assessment, 35, 5999 hits (page loads)

Figure 6.2 details the extent of student usage of the Wiki homepage designed by the tutor in Chapter 3, as illustrated by the number of hits:

35,599 hits for a student cohort of ninety-six learners over a four week period. The spread of activity over this period identified in Figure 6.2 shows most activity occurs towards the end of the week. The majority of engagement took place on Thursday when the students were timetabled for this module. It is evident students were working constantly throughout the week but with higher levels of activity on Sunday than on Saturday. This was the 'communal space' in Wiki designed by the tutor and intended to provide learners with the opportunity to collaboratively author resources, content, news and to problem-share. It is evident from the results in Figure 6.2 that learners made use of the Wiki to support the collaborative experience. Although the data does not provide insights in depth in terms of 'how' learners engaged in the Wiki, the findings are a useful indicator of learners' patterns of using the Wiki and provide an indication of learners' study patterns. As shown in Figure 6.2, learners were working on the assessment at weekends and during the week. Therefore this is regarded as an indication that the Wiki was used by learners to support the collaborative experience. This outcome was important to the tutor during the early stages of the design of the Wiki learning environment, providing feedback on the learners' use of the Wiki and usage study patterns.

6.3 Collaborative learning and technology in use

This section discusses the findings based around the key research theme **collaborative learning** and **technology**.

6.3.1 Community learning

Given the blended learning environment was set up to support collaborative learning and the tutor specifically designed the learning environments with a 'community' ethos (as detailed in Chapter 3) and was influenced by the community concept (Wenger, 1998) it was important to gain an understanding of the learners' perceptions of their purpose or goal in their learning environment relating to learner perception of 'community'. This would make visible 'shared' perceptions relating to the 'community' and 'collaborative' ethos of the learning environments and understanding of the differences in perception between the tutor's and the learners' views of the learning environment. It was then intended to take this feedback and feed it 'forward' into the learning design of the main study.

There was evidence in the learner reflective Blogs to suggest that learner's comments related to 'Community' and their rationale for community was 'People-Oriented' and 'Task-Oriented' comments as shown in Table 6.2 and Table 6.3 respectively. As Table 6.2 shows, for those learners whose comments related to People-Oriented rationale for community, it was important to the majority of learners that learners worked together and got to know each other. Table 6.2 shows learners included comments about: trust, reliability, honesty, being organised, being responsible, friendships, the bringing together of skills, putting forward thoughts and ideas, common interest, helping one another, sharing, communication, discussion and participation. These were seen as important in their collaborative

experience. Thus it was important to People-Oriented learners to engage and interact with their peers in a community of learning conducive to trust honesty and the formation of friendships whilst undertaking the assessment collaboratively.

Student No.	People Oriented
1	all working together
12	we share information
2	to get to know each other
3	Interaction between the group
13	the ability of work together
14	each member of the group to be responsible, reliable
15	great way of forming a team
17	you can trust each other and rely on that person
18	may form strong friendships
4	everyone had different skills that they brought
19	group members respective of each other's needs
20	We all have jobs to do and rules and regulations to adhere to
5	when all members of the group participate
21	by putting forward their ideas
22	contributing by answering questions that have been asked
23	knowing what is being said in the group
25	agreeing or disagreeing with group
26	good atmosphere in the group
6	set of people with some shared element
27	able to share personal views, opinions and values online
7	show enough commitment to do work
28	helping each other individually and build up and become stronger
29	the feel of satisfaction when helping one another is satisfying
30	spending time together as a community

31	regular communication will help work well together
32	share ideas, thoughts, feelings about certain issues
33	creating a sense of humour, creating a bond, having a laugh
34	produce a calm approach to ideas and views and makes a community more enjoyable
8	greeting their fellow group members
36	shared information about themselves
37	community offered the members a chance to work as part of a team
38	each contributing their thoughts and ideas to support each other
9	it is setting the highest standard of work as possible
9	learning from one and another's mistake and correcting it
11	like minded parties sharing similar interests and thoughts
12	all group members are communicating with each other
14	we get to know the other people as we put up personal details and information about ourselves
15	need interaction between people who are reliable, honest, organised, responsible
15	good way of forming a better team
15	different skills combined as one, we can help each other
15	whole team share ideas discuss any problems
40	to let other people know of if there are any problems or changes
16	to find someone who knows the answer to your question and is willing to help you
40	members of the group interacted with each other
59	learn from each other, using other's ideas, to share their views and ideas
38	another student will know the answer
16	to broaden our horizons by interacting with unknown people
41	to support all other group members

Table 6.2: Extracts of learner comments from reflective Blogs related to people-oriented community

Table 6.3 shows examples of extracts of learner comments derived from their reflective Blogs where task-oriented comments are deemed to convey

learners' rationale for community. As Table 6.3 illustrates it was important to task-oriented learners to fulfil the requirements for the assessment and achieve the best possible grade. It was important to these learners to communicate effectively with their group members relating to completion of tasks. In summary, the comments included: complete, discuss and communicate as related to task completion, review, and produce, to work together as a group to achieve the best mark/grade, to organise and to help manage the tasks within groups.

Student No.	Task Oriented
1	to work together on tasks
12	to fulfil requirements
2	To complete tasks
13	to review all the tasks
14	to complete the set tasks
3	to discuss and analyse for task completion
15	to produce relevant issues as well as results
16	to communicate well and efficiently about tasks
17	to contribute various ideas and opinions on tasks
22	to get input from a variety of different people on tasks
23	a range of different skills, abilities and talents to complete tasks
25	to be responsible and reliable to achieve the best grade
27	to achieve the objectives and the tasks set
29	to understand the group assignment
31	learn how to work effectively with one another to complete tasks
38	to work as a group on the assignment
41	to work together as a group to get the best mark
42	to discuss and analyse different tasks

45	to produce an online assignment
47	to get the coursework finished
50	to develop our skill and knowledge and gain a better understanding
5	to complete the group assignment
52	to make sure that we all meet the criteria
55	to make sure we draw up an action plan
56	a guide for the group to follow and keep up with
57	the group will attend all meetings
58	complete task given on a weekly basis
62	to reflect on what has been taken place
6	to interact about tasks
63	to analyse the use of Wiki
64	to achieve our ultimate goal
71	to set tasks to each member of the group fairly
72	set deadlines giving reasonable time
73	will help manage the coursework and allow collaboration
84	to reach a logical decision
85	to post the individual group members contribution
89	to organise and structure the assignment
91	getting the best possible grade
9	to work together to collectively complete an assignment
92	to complete each task within the required time
93	complete each task to the best standard we can as a group
9	discussed each requirement and would give feedback on the that
11	to reach their individual goals in order for the group to achieve
11	to complete all tasks set out in the coursework specification
12	to facilitate the completion of the group project
12	to help with achievement of the project requirements
13	to find requirements for a case study

Table 6.3: Extracts of learner comments from reflective Blogs related to task-oriented community

Particularly evident in those learners who were 'people' oriented (as opposed to 'task' oriented) was the need for learners to feel a sense of belonging to a community to participate, interact, and form friendships, highlighting a need for belonging. The results also showed the importance for 'task' oriented learners of having the opportunity to manage their learning and learning environment for task completion. And although people were important for 'task' oriented learners the emphasis was on achievement and task completion in order to obtain results and good grades. Thus it is important to accommodate social and task leaders and design assessment that achieves balance between people and task.

6.3.2 Participation and engagement in groups

The group set up an individual group commitment. Learners were required in their reflective Blog to show evidence and demonstrate how they met their group commitment based on activity 1 which was designed by the tutor to nudge and nurture social learning (see 3.4.2.1 in Chapter 3). Although this was an individually assessed task it required the group to agree ground rules and protocols for engagement, to organise meetings, exchange contact details and general group housekeeping in order to complete the group based tasks and commit to the collaborative experience.

These are examples of evidence to suggest that groups set ground rules that showed 'respect' for each other, and were set to encourage group participation and interactions between groups. Learners clearly set out their

expectations of each other and supported this by setting clear boundaries, for instance, *“use the online facilities with respect and care”* (Group 1). Learners showed agreement relating a support network: *“look to help each other when help is needed”* (Group 5) and demonstrated a sense of solidarity. Examples showed evidence of protocols agreed by learners for group behaviour whilst engaged in the collaborative experience *“Inform the group in sufficient time...”* (Group 7) *“keep regular contact...”*(Group 9) and *“inform the group if you are going to be late”* (Group 11). There are examples of evidence from the Wiki contributions made to the private group space suggesting some students groups set their own learning agenda *“update Wiki daily”* (Group 8) and *“do the work that’s been set”* (Group 10). Further, there were examples of evidence of learners’ agreement on the allocation of tasks between learners: *“all work will be divided equally between all group members”* (Group 1). In summary, examples provided have shown evidence to suggest that a Wiki may be used to support collaborative learning through assessment.

There was evidence to suggest that learners agreed social policies between group members for engaging in the collaborative experience. This was evident in the Wiki contributions submitted by groups. Such learners related to their group as a community.

There was also evidence of community through participations in the form of mutual negotiation (Wenger, 1998) and this was evident amongst learners: *“discuss all ideas”* and *“involve everyone in the discussions”* (Group 2). There were also examples of evidence to show that learners came to an

agreement on a communication strategy to support the collaborative experience: “*stay in communication*” (Group 3) and “*each member must attend each arranged group meeting*” (Group 4). To help keep in touch during the collaborative experience, learners submitted their contact details in the Wiki, as well as etiquette and protocols for good manners: “*stay in communication*” (Group 3), “*any group member that cannot attend a scheduled meeting must let other know in advance and group members must keep regular contact (outside meetings) with each other*” (Group 7).

There was evidence to suggest groups of learners agreed their working practices in the Wiki. Figure 6.3 shows an example of Group 5’s agreed working practices. The learner names have been blurred to maintain confidentiality. These working practices were agreed within the Wiki amongst Group 5 by means of a project plan, with completion dates and tasks completed. Group 5 also agreed to use colours to identify individual group members to help identify their contributions to the Wiki related to the completion of learning tasks. This is also reflected in their agreed use of a Wiki page to act as a discussion area relating to the collaborative experience in Figure 6.4.

Project Plan

Task	Aimed Completion Date	Actual Completion Date	Complete
1a	04/11/05	04/11/05	Y
1b	08/11/05	10/11/05	Y
2	13/11/05	14/11/05	Y
3	18/11/05	19/11/05	Y
4	19/11/05	19/11/05	Y
5	01/12/05	N/A	N/A

Discussion Area

Discussion	Colour
Discussion	Purple
Discussion	Red
Discussion	Pinkish
Discussion	Green
Discussion	Blue

Figure 6.3: Group Agreed Working Practice using colours

I think virtual community means people who are social scientists and theorists having talked about development and expansion of online communities. It sounds like a group of people helping each other out explaining different points of a discussion.

A virtual community is a community made from people all trying to achieve the same goal, such as a computing project, or made from people with a common interest or with similar views. The members of the virtual community use blogs, forums, messenger programs, conference ca and similar mediums on and offline, but not in person, to communicate with each other to achieve there goals.

Do you think that a WIKI is suitable for capturing and documenting user requirements using a “brainstorming” method?

I think this project has proven that a Wiki is more than a suitable method for eliciting information in a brainstorming style, our group have had r meetings with all members of the group present. So this goes to show that using the internet allows people to meet and discuss things witho the constraints of choosing a venue everyone can get to, picking a time good for everyone to meet, i believe that it could even be possible to wr cross language barriers with a Wiki, it could require the use of an outside translator, but it would be simpler than have a room with people sayir things in several languages.

I think WIKI is suitable for capturing requirements because is works in the same way as making written notes, and anything that we may use, li interview’s and monitoring video recordings can be attached for analysis, pictures can be used to illustrate tasks. There are endless possibilities what WIKI can be used for in capturing requirement.

I think wiki is suitable for capturing and documenting using the brainstorming requirements because anwsers can be passed on and more ideas be generated from others in the group has it is written on wiki. A brief discussion may follow at a later stage. Possible solutions will be given. W is a good advantage.

Before we started this project i had seen how WIKI's had been used elsewhere to great effect in collaborating ideas and work to create projects that were better then could have been achived without a WIKI. This project re-enforced what i had seen before we used the WIKI · great effect when capturing and docuementing our user requirements when brainstorming, many ideas were throw in and then disscused w allowed us to create effective system requiriments. So from what i have been previously and with the work that we have done on the WIKI can say that yes the WIKI is an extremely suitable and effective tool for capturing and documenting requirements using brainstorming.

Figure 6.4: Wiki page used as a discussion forum

The use of different colours agreed by Group 5 in Figure 6.4 represents the contributions of individual group learners to a discussion. Learner Group 5 decided to use the Wiki pages to act as a discussion forum. Figure 6.4 shows an example of the evidence of these learners thought processes and conceptualisation of the online experience. This discussion shows learners engaged in discussions relating to their use of the online environment in particular their perceptions of a 'community': "*it sounds like a group of people helping each other out explaining different points of a discussion*" (Group 5). This is reflected in the behaviour of this group of learners as they are using the online space to house a discussion where there is evidence of explaining concepts to their peers. They go on to describe a virtual community consisting of group members with a common goal and relate this to their own experience of undertaking the group based tasks: "*all trying to achieve the same goal such as a computing project*" (Group 5). They proceed to discuss the varying technologies to support the undertaking of the project and related to the components of a virtual community and it is evident that this reflects this groups experience: "*the members of the virtual community use Blogs, forums, messenger programs...*" (Group 5). In addition to the technologies provided to support the collaborative experience Group 5, as was typical of groups, used MSN instant messaging program to hold meetings, communicate and interact with group members relating to the group based tasks.

6.3.3 Learner attitude, Wiki supports the collaborative experience

Group 5 learners proceeded to discuss the value of a Wiki to support the collaborative experience. There is evidence to suggest that learners typically valued the Wiki in particular for the opportunity to hold meetings without physically being in the same place: *“using the internet allows people to meet and discuss things without the constraints of choosing a venue...”* (Group 5). Group 5 also valued the technologies features allowing the sharing of content, uploading of recordings and pictures to illustrate completed tasks online. There is evidence to suggest the learners valued the opportunity to share ideas and time to ingest these and discuss them at a later stage. Overall, Group 5 found a Wiki supported their collaborative learning experience whilst completing the assessment. It is evident, through this discussion, that Group 5 learners were sufficiently motivated to engage in discussion which was additional to the five set learning activities set by the tutor in Section 3.4.2.1 in Chapter 3.

Typically in the learner reflective Blogs learners commented on the suitability of a Wiki to support the collaborative experience and completion of the assessed learning activities as shown in Table 6.4.

Student No.	Wiki support – learner comments
1	Wiki proved to be very useful
1	the most helpful part of Wiki is that someone can work on any task at any time
1	the ability to review who has written what and who has changed
1	not limited to the amount someone can post
1	you do not have to switch pages to see someone’s reply

1	add pages and edit proved helpful
2	quickest way each member could express their ideas
2	we could post up each task we did and the other members could alter it
2	it saves contacting each member individually
2	it was a success because each member visited Wiki at least once a day to check for updates
2	we used Wiki to post up the questions we were stuck on
3	helped our group to communicate with each other
3	discuss as well as overlook any relevant information
3	all tasks posted therefore enabling each member of the group to see the progress being made
3	clarify and further enhance the level of work submitted
3	allowed us to centralise all our work
3	enabled each member in the group to access all the research completed by other members
3	access other users opinions, access previous group discussions and brainstorms
3	to help keep up-to-date with the progress of the project
3	would simplify it as much as possible
3	ensure that participation in the project was free from intimidation
3	the ability to edit as well as delete input leaves room for error correction
3	gave group members an added sense of confidence and encouraged them to further participate without worrying about making mistakes
4	great area to support our assignment
4	loads of pages set up for the different tasks
4	and our own pages which was only to be edited by the person
4	we used the area to put up all the minutes of the meeting
4	everyone could check that they knew where they were
4	main page used purely for links to all other pages which made the Wiki really easy to work with
4	you could find information really easily
4	more importantly knew where to put the information
4	great resource for this assignment as it gave us the ability to upload information online

4	everyone could access and modify
4	one copy of the work online it was easy to modify and amend
4	less chances of data redundancy
4	separate pages for each of the tasks made it easy to organise the information and locate it
4	saved a lot of time and reduced errors
5	hard to use at first because some members could not log in
5	hard to arrange for individuals to do a task
5	we can have individual pages for each question, edit where necessary
5	allows users to attach files, format tool (limited) are available for text styles
6	share ideas and give comments
6	we can access and adjust the assignment
6	from different places
6	not everyone has to get together...as we can communicate from anywhere
6	all tasks online group members could refer to it
6	ground rules posted on Wiki and everyone read them and understood what was suppose to do
6	everyone can access it and can know how the group is progressing
7	Wiki is a great way of communicating
7	it's straight forward to use
7	fast way to communicate as there can be group members that cannot meet up
7	can check what's been completed
7	can gather ideas and solve each other's problems
7	get to a particular point by gathering everyone's ideas and thoughts
7	allows user to attach documents, presentations, images, journals and web links
7	allows members of the group to edit the attached documents to be able to add their own ideas
7	Wiki has given a great support to our assignment...everyone had a say and to give their own ideas
8	allowed the group members the chance to post their ideas
8	the group members could edit the contribution of other members

8	post their own ideas and comments
8	allowed the group members to collaborate
8	and carry out the brainstorming part of the assignment
8	provided a place to submit the individual group members contributions
8	Wiki provided the balance of feedback where necessary
8	the comments part of the Wiki was useful in supporting the completion of the assignment
8	comments feature enabled the group to evaluate the page
9	the place in which our group collaborate the most effectively
9	we have introduced ourselves, said a little about ourselves
9	documented our findings
9	brainstorming and evaluated
9	points could be added to and separate brainstorms were done on different pages
9	work spread out and we could go between tasks easily
10	helped improve communication
10	have got to know each other better
10	able to organise meetings
10	add content as on an internet forum
10	allows anyone to edit the content
10	able to function as a team
10	and use the Wiki as a means of effective communication
10	we are able to share work as it is all on our Wiki
10	able to view each other's work
10	we have organised our contributions in a clearly defined work area for each group member
11	has proven instrumental to the completion of the coursework
11	allows the group to collaborate online but without having to be online simultaneously
12	allowed us to pool our ideas for this assignment
12	only our group can put all our ideas
12	can only be accessed by members in the same group
12	brainstorming occurs and from the ideas the final draft is created

12	communication occurs on the Wiki where important issues can be addressed
13	post our work online
13	edit it at the same time when it needs amended
13	ask members for their opinions
13	add more detail on the tasks
13	saves us time to meet up in person
13	we write our work by just using a web browser
13	keeps track of changes
13	put and share useful ideas, resources, use it to chat to members, solve problems
14	communicate without actually talking to another person
14	accessed anytime by each group member
14	put up information or work so others can see it
14	people can comment on it and add more to it
14	using Wiki as notice board to inform other members
15	we can communicate together
15	discuss relevant information about the assignment
15	make comments
15	arrange meeting times on our group area
15	group members can edit, input and delete information
15	can have enough information for the entire group to view
15	can post attachments of their own work
15	other group members can help instruct members
16	helps to collaborate
16	allows users to freely edit and create using web browser
16	hyperlinks and simple text for creating new pages and cross links between pages
16	everyone can make changes and contributions

Table 6.4: Extracts of learner comments relating to Wiki support for the collaborative experience

Table 6.4 shows learners' comments relating to how the Wiki supported the undertaking of the group-based assessment. Overall groups valued the opportunity to collaborate, create and edit pages that other learners could change and contribute to: *"points could be added to and separate brainstorm were done on different pages"* (S9). There is evidence to suggest that groups valued the features provided such as the ability to create hyperlinks, attachments and access the Wiki using a web browser: *"we write our work by just using a web browser"* (S16). Flexible learning was supported as evidenced by learner comments, in particular the ability to work at their own pace from anywhere and to accommodate different learning styles, such as the use of hyperlinks, attachments and/or directly commenting, creating and adding to by typing in the Wiki pages. Learners commented that the Wiki supported the 'people' aspects of group work: *"put and share useful ideas, resources, use it to chat to members, solve problems"* (S13). Learners commented on how using the Wiki for group work enabled learners to communicate, help and support each other in their learning: *"we used Wiki to post up the questions we were stuck on"* (S13), *"discuss relevant information about the assignment"* (S15), and *"put up information or work so others can see it"* (S14). Additionally, learners used the Wiki to keep in touch with group members: *"using Wiki as notice board to inform other members"* (S14) and commented that using the Wiki could *"ensure that participation in the project was free from intimidation"* (S3) and *"gave group members an added sense of confidence and encouraged them to further participate without worrying about making mistakes"* (S3).

6.3.4 Study patterns

There is evidence from the Blogs to suggest that learners were working on the tasks in meetings in the evenings in addition to daily activity. The Wiki technology does not constrain learners to work to study during the normal working pattern, 0900-1700 hours. There is evidence from the learners' reflections that Group 7 studied through the night from 9:30pm until midnight. Some groups met physically on campus having met earlier in the day. This was typical of learner groups. Student 3 in Group 7 reflects:

"We met up again today at 9:30pm even though we had met up earlier at 3.00 pm. We finished this meeting around 12 am which just shows the total commitment of the group and shows that everybody is really trying their best to be successful in this coursework and hopefully we do" (S7).

and:

"The reason for this second meeting was that not all of the group could make it for the first meeting, so we thought it would be vital that we make a second meeting where all members are present to talk about exactly what was done in the first meeting at 3pm" (S7).

and:

"Today we were able to do a storyboard for the system we able to make various drawings and able to generate many ideas between us. I felt that the group today went very well and I would firmly say it has

been one of the best meetings we have had. We were productive and worked very well may be its because the day of handing in is getting closer 😊😊” (S8).

These examples of learner reflections suggest that the learners in Group 7 were committed to completing the tasks and to doing their very best. This was typical of other groups of learners' comments provided in their reflective Blogs. Such reflections also provide an indication into the study patterns, the time of day and work carried out before the assessment submission deadline.

6.3.4.1 Sharing resources within and across groups

There was a wealth of evidence of students sharing resources within groups and across groups. Figure 6.5 is an example that shows a shared space, which was set up by learners off the 'communal' space in the Wiki. Learners designed their own mechanism for engagement and sharing resources. These engagement protocols were via hyperlinks on a Wiki page. Figure 6.5 shows hyperlinks to Internet pages external to the Wiki which house content relating to various topics such as Blogs and various topics under study, for example e-learning, for students in Higher Education. Figure 6.5 illustrates how groups 10 and 12 shared resources. These were typical of learner contributions to the 'communal' space in the Wiki. Figure 6.5 also shows how Group 5 set up a discussion area in the Wiki to collaborate with peers from across the cohort of learners.

The majority of groups provided a summary of research findings to share with the cohort of learners. For example Group 10 accessed articles on the

web relating to issues around requirements analysis needed to undertake an assessed task. The findings were summarised by Group 10 and the link to the article was made visible on a Wiki page to be shared in the communal space in the Wiki. The majority of groups contributed to the shared resources page after Group 10. There was evidence to suggest that other groups followed the engagement protocol set by Group 10, such as, to provide a summary and a link to the article to share with peers. 8 out of 10 learner groups followed this protocol, apart from Group 5 and Group 12 who had submitted their contribution prior to Group 10.

http://www.theshiftedlibrarian.com/archives/2005/10/26/blogs_vs_wikis_presentation.html

<http://ferret.bemidjistate.edu/~morgan/cgi-bin/blogsandwiki.pl?WikiAndBlog>

<http://wiki.org/wiki.cgi?WhatIsWiki>

<http://wiki.litestep.com/Index>

-

http://en.wikipedia.org/wiki/Internet_forum (group 5 Discussion Forum)

Group 12

Blogs: <http://news.bbc.co.uk/2/hi/technology/3734981.stm>

http://www.wisegeek.com/what-are-blogs.htm?referrer=adwords_campaign=blogs_ad=900909&_search_kw=blog%20definition

Wikis: <http://www.ariadne.ac.uk/issue42/tonkin/>

Group 10 - reading on blogs and other alternative technologies

<http://newton.cs.concordia.ca/~paquet/wiki/index.php/Requirements> - discusses the issues revolved around the requirements analysis. States issues such as stakeholder, s human issues and solutions. This is where it mentions the use of alternative technologies

http://www.signonsandiego.com/news/computing/personaltech/20031013-9999_mz1b13blog.html - talks about why blogs are good from what they use to be and how they l grown.

http://www.wired.com/wired/archive/2.06/vc_principles.html - nine principles in making on line communities work, and compare different types of technologies.

<http://www.chs.ecu.edu.au/conference/TILC/abstracts.php> - This link has various articles relating to the use of e- learning for students in higher education and talks about different on line communities and how they help e learning. This paper outlines the method for engaging students in blogging, the success of the blog experience and the relevance of blogging for effective online teaching and learning pedagogies.

<http://ferret.bemidjistate.edu/~morgan/cgi-bin/blogsandwiki.pl?WikiAndBlog> - talks about wikis and bloggs advantages and disadvantage:

Figure 6.5: Learner generated shared resources

As discussed Figure 6.5 demonstrates how learners' shared resources relating to research findings. All ten-learner groups identified themselves to other groups using their group number. The shared learning resources were

beyond that expected of the learning activities set by the tutor in Section 3.4.2.1 in Chapter 3. There is evidence to suggest that the topics chosen by groups, such as Blogs, discussion forums, the use of Wiki and e-learning in Higher Education, reflect learners' use of the technologies to support the collaborative experience. This shows that learners were motivated sufficiently to engage in learning beyond the learning activities designed by the tutor. This also shows that learners valued the opportunity to share resources with their peers, both within their group and with other groups.

Figure 6.6 illustrates the research undertaken by Group 9 prior to undertaking the core task (3.4.2.2 in Chapter 3) and shared in the communal resources area in the Wiki. This was intrinsically motivated by the group of learners as this was not a requirement in this study. These research findings were shared in the communal area in the Wiki, highlighting the desire for Group 9 to share their findings of their research with the wider community of learners, as was typical of groups.

Group Nine

The research began by looking for information and examples of good HCI. We think that this will help us in creating a system relative to the users needs. We found a good site <http://www.dfki.de/~jameson/hci/> check out the PDF files which take you through the processes of ensuring good HCI.

We then wanted to find a similar business to that of the case study to compare our original thoughts to a completed system. However we were cautious as we felt that we needed to find not only a similar business but one of a similar size. We found <http://www.bestbear.co.uk/about.htm> we thought that this site was relevant to the task as although it is only for hiring child-minders we felt that it was a good example. It could also be developed further if the business grew to offer more services.

As part of my role as System Analysis I did some research into the position itself I found a useful website below which highlighted a lot of important roles I didn't know before. http://pespmc1.vub.ac.be/ASC/SYSTEM_ANALY.html

The following site shows many useful points of the role of Business Analysis in a bullet point view. http://www.siliconbeachtraining.co.uk/systems_analysis_design_training/business_analysis

Figure 6.6: Shared resources *intra* groups in Wiki – Group 9

6.3.4.2 Technology used by learners

Having completed the group commitment task, learners were expected to complete the core learning task as a group (activity 2 in section 3.4.2.2 in Chapter 3). Learners were expected to choose a method: interviewing, direct observation, brainstorming or another method of their choice. It was suggested learners record this practice using one or more of the following: video, webcam, audio, podcast, or a document in the Wiki, or capture ideas using the discussion forum, or another method of their choice. The findings related to technology used to complete the recordings are shown in Table 6.5.

Technology used by Learners	
<i>Mobile phones</i>	8 out of 10 groups to complete the core task (recording)
<i>Podcast</i>	2 groups linked to Wiki contributions in the communal space
<i>Video Recorder</i>	1 group and owned by a group member
<i>Scripted Podcast</i>	1 group provided a transcript in addition to a podcast
<i>Scripted Videos</i>	5 out of 8 groups (who made a video) provided a script in the Wiki

Table 6.5: Technology used by learners

Results from the qualitative data derived from the individual reflective Blogs and used to gain insights into the learner experiences and views of the collaborative experience are shown in Table 6.5.

6.3.5 Students use of videos, podcasts and their own mobile technologies

As shown in Table 6.5, 8 out of 10 groups used their mobile phones to complete the core task (learning activity 2 in section 3.4.2.2 in Chapter 3). Two groups chose to make a podcast and link this to Wiki contributions. One group used a video recorder and one group provided a transcript of their group podcast. Of those who chose to use their own mobile phone some did so to record an interview and others showed how they brainstormed as a group to undertake the core task. Of the 8 out of 10 groups who chose to use their own technology to record the core task, half also transcribed the

process in the form of a script and attached this script to the Wiki page to share with the cohort. This was not part of the assessed learning activities. There is evidence to suggest this may be 'mimicking' the tutor, reflecting the tutor's practice when delivering the core task as the tutor provided the task in video (Jumpcut), audio (podcast) and a script in the Wiki.

6.3.6 Students use freely available web 2.0 software

The majority of groups (6 out of 10) decided to edit the video using Jumpcut web 2.0 video editing software and stored the video on the Jumpcut server. This software is freely available for use on the Internet and was used by the tutor to edit the tutor video provided for the core task. The learners then created a link to the video and placed this on the communal area in Wiki to obtain feedback from another group as in Figure 6.7. A different group of learners composed the feedback on a Wiki page and created a link in the communal area in Wiki to share with other groups. This feedback was then used and incorporated into the Requirements Document template provided by the tutor to complete the core task and the completed document was included in the group assessed report.

Group 9 Interview/Brainstorm
The following link shows the recording by a team of Software System Developers (Group9) who use a combination of an interview and brainstorm to capture the requirements of a small system named 'Little Horrors Child Minding Agency'.

Below is the link to our recording which we did using mobile phones. We then used jumpcut to add a few extras, and as a place for it to be viewed.
<http://www.jumpcut.com/view?id=7CC84AAC78A511DB8AD23EF340157CF2>

Below is a link to see exactly what was said during the Interview/brainstorm if the recording can't be heard.
Go to the following link to see the script: [Script](#)

Figure 6.7: Group Wiki contribution

6.3.6.1 Engagement with video

Of those groups who recorded video and used Jumpcut for editing the video there was evidence to suggest that learners valued this technology to complete the core learning task: *“Jumpcut has really supported my group in task 2 as it has enabled us to be able to upload our video”* (S15). There was also evidence to suggest that learners had difficulty with the quality of the video produced. What follows is verbatim extract from the discussion forum posted by a learner relating to the recording of the core task. This posting was made by student 3 on behalf of Group 5 and intended to communicate with the other group who were evaluating the completed task (see section 3.4.2 in Chapter 3). However, given the poor quality of the video recording, the group decided to provide an explanation to the group who were evaluating the recording of the video content.

Student 3 wrote:

“The picture is not that clear as it was taken using a web cam, so I’ll describe a little about what its supposed to be. It is a DVD vending

machine which is similar to the one outside the union shop and the ellie house bar... Then to return a DVD the user needs to swipe the membership card on the machine then drop the DVD back into the post box provided on the machine and this method of return is similar to the way books can be returned in the LRC”(S3).

Although the quality of the recording was deemed to be poor, the group recovered well, demonstrating real depth in understanding of the requirements for the computer system, illustrated by their clear explanations and relating this to a ‘real’ world system *“one outside the union shop and the ellie house bar...”*; a vending machine housed at the university student services.

Feedback from the ‘evaluator’ Group 4 was very encouraging: *“It’s great to see that you were able to put the prototype up but its a bit of a shame that it didn’t come out properly in the web cam picture, as I thought the design is pretty impressive”* (S22).

One group experienced problems with recordings when using their own technologies in the computer labs. A learner reflects:

“When we were trying to do the recording with our web cam in the lab in D405 we had a problem with the web cam and the microphone and we found the computer was not enabling us to record sound with the video. So we decided to call one of the technicians and we found that there was something wrong with the computer we were trying it on. With all

this time wasted on trying to get the web cam and microphone to work we then found that the room we were in was to be occupied by a class so we then had to move to another class and do the set up of the web cam and mic again” (S17).

It is evident from the example of learner comments that the process of using the group’s own web cam with institutional resources was problematic and caused this group a great deal of frustration whilst trying make the recording to complete the core task.

6.3.6.2 Engagement with the discussion forum

From the beginning of the Information Systems Development module the discussion facilities embedded in the University’s MLE were used by both the tutor and learners to extend the class based dialogue and to promote an ethos of collaborative/community learning environment. Its use was shown to stimulate collaboration, participation and interactions between tutor-learner, learner-tutor and between learners. The impact is presented in section 3.3.2 in Chapter 3.

When the group came to a consensus relating to their choice of method and recording device it was important to inform the tutor to ensure that learners could be supported. To this end, learners were required to use the discussion forum on the MLE to notify the tutor of their agreed choice. Figure 6.8 shows an example of the students posting to the discussion forum and followed by the tutor’s response to the posting on the discussion forum. This

was typical of students' contributions to the discussion forum relating to the method chosen for the core learning task (activity 2 in section 3.4.2.2 in Chapter 3).

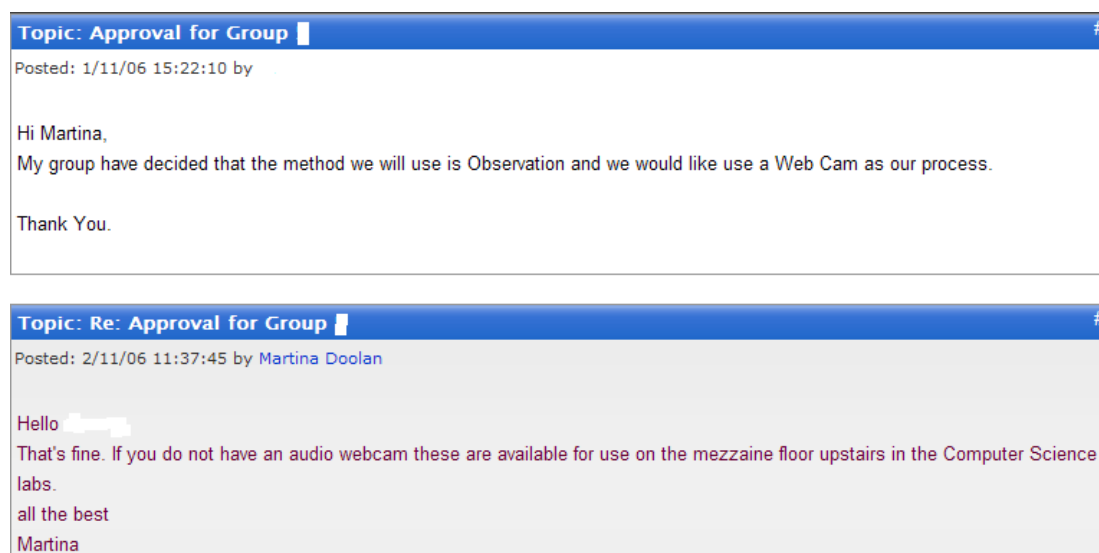


Figure 6.8: Discussion Forum contributions – Group 1, student 3

The discussion forum was used by learners to gain support from the tutor relating to the technology and the assessment and was embedded in the module from the start for learners to communicate and interact with their peers whilst extending the class based dialogue. Student 3, Group 1 posts on the discussion forum a posting which was responded to by the tutor as shown in Figure 6.8. Student 3 then posted both postings to the discussion forum addressed to the group of six learners; however the discussion forum is open and transparent to all the cohort of learners and those registered on the module site such as tutors. The exact posting is presented in the learner's own words and this is followed by the tutors' response, posted for the group to see. Student 3 wrote:

“Hi all,

I put up the following question to Martina

Are we allowed to add any applications to the Wiki that could help us with this task, i.e. To do Lists, Project Manager or would we have to design our own pages within our own area's to do this sort of thing?

Regards

this is the reply” (S3)

“Good question, you may add the application if you feel it will be more useful than simply adding pages, entirely up to you and what suits your group needs best. However, do make sure to document this in your Blog stating the rationale, how you used it, its usefulness or otherwise. You might also like to document in your private group area whether this was a joint consensus amongst your group, as to how you might use it to support the group or anything else which you feel may be relevant Hope this helps Martina” (tutor response).

Student 2, Group 1 then uses this content to direct the group. Student 2 posts

“Can we add this to the agenda for our first meeting? We need to set a date fairly soon, as we have to decide what method we want to use to get our requirements. I have a web cam and one to spare if that's required. Has anyone got their hands on their baby/child pics yet?” (S2)

There was evidence in the Wiki in the private group area to show that Group 1 learners identified themselves to each other using their baby pictures. As is evident in this posting, this was agreed by the individual members of the group. The posting also shows that student 2 and student 3 in Group 1 were directing the group by politely nudging them to add items to the agenda: “we need to set a date fairly soon” (S2) and “have to decide what method” (S3). It is evident in the posting that this learner is offering support: “I have a webcam” (S2) and offering to share with others: “and one spare if that’s required” (S2). It is also evident through this posting that this group has discussed the use of “their baby/child pics ”(S2) to support the collaborative experience. Opportunities in class for group introductions was provided by the tutor to help build a group dynamic, as sense of community and prepare learners for the collaborative experience (see Chapter 3).

There was evidence to suggest that learners provided each other with a support network and answers to postings were responded to by the learners themselves in addition to the tutor.

“I like that my questions can be answered by fellow students as well as by the tutor” (S11).

and:

“I am put at ease when someone else opens up and tells the 'ISD2 world' they have the same problem I might be having. It gives me the confidence to say help!” (S15).

Student 11's comment shows evidence that learners had confidence in other learners' abilities to help solve problems in responding to postings alongside the tutor. In so doing, the evidence suggests that learners helped each other in constructing their own knowledge and conceptual understandings of subject matter. The second comment made by student 12 suggests evidence that learners felt that they 'belonged' to the module "*ISD2 world*" and were reassured that other learners experienced similar problems in learning. These were typical of such comments. Further evidence suggests that learners had the "... *confidence to say help!*" (S33) openly within the discussion forum which was shared by the cohort of learners, the teaching staff and other staff registered to access the module.

6.3.6.3 Engagement with the MLE

The previous section presented the impact of the discussion forum housed on the MLE on the learners' study behaviour. There was evidence based on the following examples to suggest that the university's MLE afforded the opportunities to collaborate and interact: "*studynet and Wiki have allowed us to collaborate and interact with each other whether its just in my group or people outside of my group*" (S20). Relating to the usefulness of the group facilities on the MLE a learner reflects "*I think that the Group Area on Studynet has enabled us to collaborate fully it has also enabled us to have a place where we can discuss work in our own time and comfort when we are not able to meet face-to-face*" (S17). These are typical of learner comments in the reflective Blogs and suggest that learners valued the flexible

opportunities afforded by the group area on the MLE to collaborate with others at their own pace and in their own time. Student 12 reflects *“We have also been able to use studynet as a place where we can talk amongst the group and if we have any problems within the group these can be kept within the group and nowhere else”* (S12). This suggests learners value the ‘privacy’ within the group area. Learners also valued the opportunity to schedule meetings using the MLE and organise work by file attachments *“instead of trying to meet up to set out the work, this just shows that studynet has kept us organised”* (S33).

6.3.6.4 Wiki supports the collaborative experience

From the learner reflections it is apparent that differences exist in learner opinion of the use of Wiki to support collaborations.

“We have been able to use Wiki as a central saving point where we can save all the various tasks under our space. It has also enabled us to all be able to go through the work when it has been done and any editing that needed to be done in some of the work could be done quite easily” (S36).

“I think Wiki has made our work easier as when we can't meet in person we are able to use it as a place where we can continue the work without meeting in person and has also helped us finish some of the tasks easier and quicker” (S23).

“Wiki also allowed us to make comments on various parts of the work that they have been done some of the individuals in the group, making sure that we are able to collaborate and make sure that the various tasks are right” (S10).

The examples provided are typical of learner comments found in the reflective Blogs. Learners valued the opportunity to save resources into one place and the opportunity to collaboratively edit and comment on each other’s work to ensure correctness. There is evidence to suggest that learners valued the flexible opportunities provided by the Wiki, such as the fact that they could work on the assessment without having to meet.

6.3.6.5 Blog supports collaborative experience

Blogs were used to capture learner reflections on the collaborative experience as learning activity 5 (see 3.4.2.5 in Chapter 3).

From the student reflections there is evidence to suggest that the Blogs were valued. The following are examples of learner reflections and found to be typical of learners experiences as derived from the reflective Blogs. Three student experiences are provided.

“The use of Blogs has enabled me to be able to have a record into what has been happening in the meetings and has helped me to be able to reflect on my feelings and makes me think into exactly how me and my group is doing in the assignment, allowing me to think about what can be improved and changed if need be” (S24).

Learner 24 valued the opportunity for time to think and reflect on the practice of group work using the Blog. There is evidence to suggest that learner 24 used this opportunity to reflect on their own contribution to the group work in addition to peers. In addition to reflecting on the collaborative experience learner 24 reflects on using the Blog as a repository for learning and a place to keep a record of group activity such as meetings.

“The Blog has been very useful, in allowing me to not forget what needs to be done also it has ensure that keep up with the work if I miss anything. The Blog has also enabled ...feeling and I has been very much a confidence booster in terms of giving yourself confidence😊”

(S33)

Learner 33 found the Blog to be useful for keeping a record on work done and work yet to do. The reflections made by learner 33 suggest that keeping the Blog boosted confidence, the emoticon is provided to reaffirm this level of confidence provided by keeping a Blog:

“allows us to have framework into anything we may decide to bring to group whether it is getting anything off your chest that may be bothering us” (S15).

Learner 15 found the Blog provided a framework, an opportunity to note group issues.

“I think the Blogs has kept me organised and made me think more about the project in terms of what I need to do and what exactly have already done” (S6).

Learner 6 used the Blog to keep organised and as a guide for what has been done and tasks yet to completed. There is also evidence to suggest that the Blog was used for reflective purposes.

“ the Blogs has also helped me to not forget exactly what work needs to be done and when, as a result I have been able to keep myself organised in delegated parts that we have split between the group” (S35).

Student 35 provides comments to suggest that the Blog was used for keeping track of work undertaken and work yet to be completed as delegated between the groups.

The five previous learner reflections show how learners not only used the Blogs to keep reflections and as a personal aid on the group process, but also provides evidence to suggest that keeping a Blog aroused feelings of confidence in the collaborative experience; indeed this learner used emoticons showing a smiley face aligned with reflections kept in the Blog. At times there were two and three smiley emoticons and never a sad emoticon present. These comments also suggest evidence that learners valued the Blog for keeping track of work undertaken and yet to be done, acting as an aid to remind learners what needed to be done and helping learners to

manage themselves and as a means to organise the group work, in addition to its role as a reflective tool.

Reflections podcast

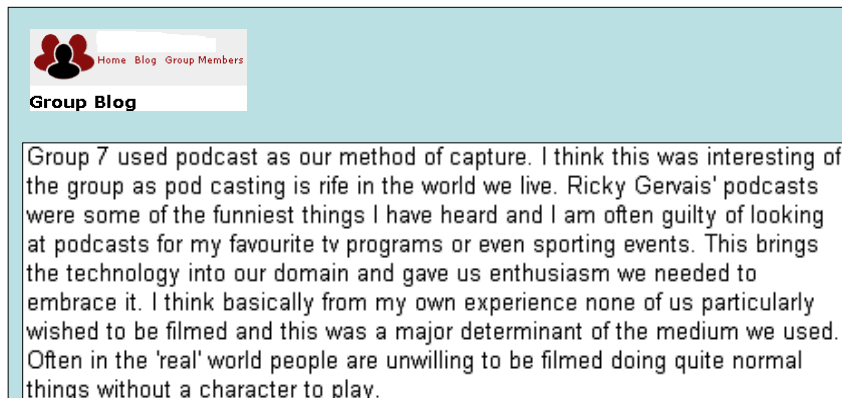


Figure 6.9: Reflections on using a podcast, Group 7

Figure 6.9 shows an example of a group who used a podcast to capture the core learning task as set by the tutor. There is evidence to suggest that this learner relates their use of podcasting, as a method within their study, to the 'real' world, conceptualising its use with that of an entertainer's use of podcasts to entertain: *"Ricky Gervais podcasts were some of the funniest things I have heard..."* (S36). There is also evidence to suggest through the learner reflections (Group 7's Blog) that the learner shows in-depth reflections relating to the group experience and issues that arose around the recording of the core learning task, preferring to use a podcast rather than

video (film). The learner reflects: *“I think basically from my own experience none of us particularly wished to be filmed and this was a major detriment of the medium we used”*(S36). In contrast to this there is evidence to show that the learner ‘missed’ the point of the core learning task, that is, to ‘role play’ a ‘real’ world experience based on a case study of a ‘real world’ work place simulation. The learner reflects, *“Often in the real world people are unwilling to be filmed without a character to play”* (S36).

There is also evidence in the Blogs to show that the Blogs were used not just for reflection but also to keep and manage references and embed links to external sources of information on the internet, as shown in the example provided in Figure 6.10.

The majority of reflections from learners offer their conjecture that the Blogs benefited their studies and ultimately the collaborative experience. To this end, the following extract is verbatim. What is evident through this comment is that this learner feels able to transfer their Blogging experience into their everyday lives and ultimately into the workplace. This was typical of learners as found from the learners’ comments in the reflective Blogs.

“But all in all I would say, the Blog has been very useful and will definitely help me in the future whether in work or whether just in my normal everyday life, I also feel it gives a structure to everything I do and gives everything I do some sort of importance” (S40).

Figure 6.10 shows an example of how learners used their Blog to keep and manage references.

References

<http://counsellingresource.com/supervision/consider.html>

<http://www2.edc.org/Int/news/Issue7/feature2.htm>

<http://www2.edc.org/Int/news/Issue7/feature2.htm>

Useful Links

<http://www.dso.iastate.edu/asc/academic/elearner/advantage.html>

<http://counsellingresource.com/supervision/consider.html>

<http://www2.edc.org/Int/news/Issue7/feature2.htm>

Figure 6.10: References and embedded links in a Blog- (S40)

6.3.7 The face to face collaborative experience

Relating to the face-to-face collaborative experience there was evidence in the learner Blogs of organising and attendance at physical meetings that took place on campus, generally on a Thursday, the day when lectures and tutorials took place. It was evident from learner reflections that they valued the opportunity to meet group members face-to-face. Student 4 reflects in the Blog:

“Today we were able to go through; Storyboards, Current Physical DFD's (CPDFD). I think today we worked quite well, even though not the whole group was present and I felt that time wasn't wasted unlike in some of the other meetings we had. I this meeting I also feel we were able to collaborate quite well together and come up with what we think is a good CPDFD from the LSOHCMA Case study. By collaborating

quite well today we were able to do the work successfully and I think that with the date drawing near to the hand in date there was much more urgency from all of us in the group. Excellent??😊😊”(S2).

There is evidence to show through these reflections that the face-to-face meeting was productive, however student 4 refers to early meetings being not as productive. Therefore it could be argued that this group had yet to learn how to collaborate. Based on this example there is the evidence to suggest that learners in this group collaborated well and worked successfully, given that they had completed a number of designs to discuss at this meeting. It is evident through this comment that the date of the assessment was drawing near and that this learner felt the group were achieving. The learner awards the group ‘excellent’ and two emoticons, which suggests the learner is content with the achievements and feels able to express this in this way to the tutor.

The majority of learners reflected on agreeing the roles to complete for the core task. A learner comments

“It also seems from organising the roles between our group people within this group are feeling more organised and confident that we will successful in this coursework😊😊😊”(S39).

6.3.8 Online experience

The previous sections presented evidence of how the different technologies provided by the tutor to undertake the collaborative experience were used by the learners. This section highlights the overall impact of the technology on the learners' collaborative learning experience online as reflected in learner Blogs. The pros and cons are presented based on the learner reflections of their collaborative experience. The positive comments are presented in Table 6.6 followed by the negative comments in Table 6.7 as derived from the learner reflective Blogs.

Online experience learner positive comments
"I think that being able to work online has helped the group... because I feel that it has enabled the group to share all the work that they have done in an easy and accessible way".
"I found that when work has been updated by a group member each of us don't have to update our copies individually and has enabled us to work together more".
"I have also found that working online has helped the fact that we can meet at a particular time which sometimes can be impossible in a face-to-face meeting"
"With this particular coursework working online has helped us to do the tasks especially task 1, 2 (Video recording on the web cam), which was vital in this coursework".
"It has also enabled us to have a common place where we can each go if have a problem allowing us to speak online if we are having problem individually".
"Another way we resolved the problem is that we talked about this problem together and made sure that next time we meet is appropriate for everybody".
"The learning online appears more profound as the discussions seemed both broader and wider".
"Online communications forces the voicing of all the students whereas in a face-to-face or in a group of people that may not happen".
"it easier to speak to someone that you can't physically see"
"much more confident in an online setting where there is no face to face contact, as they may be shy"
"Online learning can serve different types of learning styles"

“can be scheduled around work and family”
“Reduces travel time and travel costs for off-campus students”
“online also helps us do things at their own pace and time”
Allows us to work in their own personal and more comfortable surroundings, there is no pressure in an online environment
“speaking online, doing things online is good as sometimes online discussions create responses that are more thoughtful because they will have more time to read and think about their responses compared to a face-to-face”

Table 6.6: Extracts of positive comments relating to online learning experience

Online experience learner negative comments
“in online meetings...it is sometimes hard to express yourself fully”
“when we had started off the work I found it quite hard to adapt to it and I think I can say the same for the rest of my group”.
“When we were doing this coursework we have had a few problems and this has really got to do with people being late to meetings”.
“but I fill that some of the time that people (including myself) were late wasted quite a bit time”
“really needs the a lot of written communications to be done”
“hours are long in terms of posting and responding to threaded questions, evaluating other group/peoples work and answering concerns and questions can be long and very time consuming”
“it can be difficult to understand somebody online unlike in a face-to-face discussion things can be more easier to understand”
“A problem is that expressions are not seen and sometimes peoples "actions speak louder than words””
“Explaining something to somebody or describing something can be quite difficult with words. So by talking to somebody face-to-face its easier as you can see peoples body language and feelings”
“We decide to meet online at different times and sometimes that can be problem as someone may not be online at the same time as another people and collaboration can be more difficult”.

Table 6.7: Extracts of negative comments relating to online learning experience

Overall, Table 6.6 and Table 6.7 highlight mixed views based on learners comments derived from the reflective Blogs. Learners valued being able to work together whilst being online, particularly the opportunities afforded to share and update each other's work. Learners also showed that they valued the opportunity to work anytime and anyplace convenient to them. There was evidence to suggest in Table 6.6 that learners were able to bring clarity to their voice given there was no physical presence and this was found to be easier than meeting in person and served to provide a sense of confidence especially for those students who are shy. There was evidence to suggest that being online allowed students to work comfortably with no pressure. However, as shown in Table 6.7, not being physically in the same place was deemed to be problematic. As in offline group learning, students' reported that peers were late to meetings, that latecomers wasted time and that learners were not always on online at the same time. There was evidence to suggest that in the online learning environment students found it difficult to explain concepts and to compensate there was a need to write more and that it took time to compose and respond.

6.3.9 Tutor observations in the Wiki

Tutor observations on the online experience particularly through the use of the Wiki shows the mode of communication was quite informal between learners. There was evidence to suggest informal use of chat for example:

*“hmmmmm, what else can i say, oh yeah i luv sleeping and eating too..
i eat anything thats taste nice” (S12).*

There was evidence to show that learners were relaxed when introducing themselves to other members of their groups online in the Wiki whilst undertaking the group commitment learning activity (section 3.4.2 in Chapter 3). Interaction was predominately text with images used to identify individuals when completing the group commitment task. Images were also used to illustrate either hobbies or favourite bands etc. Figure 6.11 shows an example of a visual image used in one of the entries by a learner in the Wiki private group space. The majority of learners identified themselves by football characters, cartoon characters, and avatars, provided baby photos and used up-to-date photos to share with their group. Through these there was evidence of supporting and nurturing student relationships, mutual engagement and trust.



Figure 6.11: Learners use of image for identification in the Wiki

Some learners used different fonts and highlighted their contribution to the Wiki pages. This was shown in Figure 6.11 and conveys originality to their individual group area and makes the Wiki web page more personal to the group. However, this could also be deemed as ‘keeping control’ of

contributions made by individual learners, although the content suggests this was simply a working practice as evidenced in Figure 6.11. There was evidence through the revisions feature in the Wiki that learners co-created and co-authored Wiki pages.

It was evident in the Wiki and evidenced in the learners individual reflective Blogs that learners co-produced video, as shown in Figure 6.12 and Figure 6.13 which illustrate videos produced by groups. These were used to complete the core learning activity as a group (see section 3.4.2.2 in Chapter 3). In Figure 6.12 the student opening the door is playing the role of a 'developer' during the core task and is intending to greet other group members who are playing the role of 'clients' (see 3.4.2.2 in Chapter 3) prior to undertaking the interview and brainstorming session to capture the requirements for the software system. Figure 6.13 shows a student group undertaking the interview for the core task of the assessment.



Figure 6.12: Group Role Play Interview and Brainstorm Video



Figure 6.13: Group Role Play Interview Video

In addition, of the 8 groups of learners who produced a video in Table 6.5, 5 out of the 8 groups also provided a script in the Wiki of their group recording; Group 1 also provided a scenario as shown in Figure 6.14. These were additional to the required learning activities, which show evidence that learners were intrinsically motivated as the content produced was not specified in the designed learning activities. The tutor observed in the Wiki how Group 1 learners decided to role play, making a phone call as 'developers' to the 'clients' in advance of carrying out their interview. Group 1 learners created a scenario of this, as in Figure 6.14. This scenario was followed by 3 videos, as in Figure 6.15 and contributions were provided in the Wiki for other groups to share and provide feedback. These contributions were beyond that expected by the tutor and beyond the assessment specification. Learner reflections on the process are captured using a Blog and presented in Figure 6.16. The illustrations provided are based on tutor

observations in the Wiki and screen shots from the Wiki and provided by learners in their reflective Blog.

Scenario

This is a phone call between the project manager from Group Developers and Mr Patel the managing director of Little Horrors Child Minding Agency. The purpose of the call is to set up an initial interview to ascertain the needs and wishes of the client in order to Identify, Describe and Validate the clients' requirements.

Hello Mr Patel, this is Emma from Group One. I'm just calling to set up an interview with you and Mrs Patel so that we can discuss your requirements with regard to setting up the new computerised system for your business.

Mr Patel: Oh ok, why is that necessary then?

Well when we start work on a new system, the most important thing for us to understand is what you need the system to do. If we don't get that right, the system may not work for you. It won't collect the information that you need to make strategic decisions for the future. We could create a system that we think does the job but without input from you and all the other stakeholders we could end up going in completely the wrong direction.


There are several ways of trying to understand what you need and an interview is only one of them. We

Figure 6.14: Group 1 Scenario in Wiki

Group 1 Interview  [edit page](#) [share](#) [set permissions](#)

Version 0, changed by 1/11/2006. [Show version history](#)

Group 1 Requirements Elicitation Method : Interview



Here are the links for the interview that was carried out by Group 1 on the Little Horrors Childminding Agency to find out what sort of system they required.
All of the links are videos and were edited on jumpcut.com, where they are also viewable.

The first link is a phonecall that was made by the Project Manager from GroupOne, to Dhires from Little Horrors to arrange an initial interview. The Phonecall script is kept at the bottom of the page.

<http://www.jumpcut.com/view?id=042C42C8737911DB892453EF340157CF2>

The second Link is the first part of the interview and the second document at the bottom is the script as the sound may be hard to hear in some areas.

<http://www.jumpcut.com/view?id=143406FC74F911DB8B75A856F9CC894>

The third link is the interview part two and again the script is below just incase it becomes to hard to hear.

<http://www.jumpcut.com/view?id=901E8DE074D211DB8A623EF340157CF2&type=>

Figure 6.15: Group Interviews links in Wiki



Figure 6.16: Individual group member reflections using a Blog

The following section provides in-depth reflections of individual group members to provide depth rather than breadth related to the learner experience. Following this, a discussion of overall findings related to the literature is presented.

6.3.10 In-depth individual reflections in Blogs

More in-depth views and attitudes were derived by studying and interpreting 'single' learner reflections derived from the reflective Blogs and presented in this section.

In addition to content analysis of the fifty-five learner Blogs to capture insights into the perception of the 'single' learner perception of the collaborative experience whilst working collaboratively within a group, a sample of three individual Blogs were selected and critiqued in Chapter 4.

These individual learner experiences are representative of a high, mid and low mark awarded to learners for the group report. The findings are discussed alongside a fictitious student name, mark awarded, and a summary of the learners' perception of their experience derived from the individual learners' reflective Blog. The criterion for choosing student reflections is based around the three key themes of the research **tutor**, **technology** and **collaborative learning introduced** in section 1.7 in 0. As such the students were selected to represent the following features:

1. The overall depth of learner reflections, usually reflected by a higher mark on the group assignment and how the learner gained from the collaborative experience. This is personified by the comments of Mary, a mature student with family commitments, studying in the business school in addition to computer science. Mary was a student who was new to almost every form of media and technology used. Mary is a good example of a student who showed real enthusiasm as well as thoughtful reflection. Mary is chosen as the high performing student, gaining 97%, obtaining the highest grade across the cohort of learners and within her group.
2. An interesting or different point of view is personified by the comments of Jack. His comments were the strongest contrast to those

of Mary, highlighting some of the negative feelings online working can elicit. Jack obtained the highest score within the mid performing group that of 49% .Overall Jack found the experience of using the alternative technologies something of a strain. However, Jack did recognise the potential for using Blogs, Wikis, and MSN to support the group-based assessment, in particular the flexibility offered by such technologies, when the group was faced with timetabling difficulties.

3. A good grasp of the learning outcomes and of the concept of undertaking the learning activities online was demonstrated by the comments of Henry in his individual reflective Blog. Henry also showed some creative flare in a photographic collage of his experiences. Henry obtained 39%, the highest mark of the lowest performing group. However, Henry and his group failed to understand the user requirements and as a result provided inaccurate requirements for the computer system. This had an impact on the remaining tasks. For example there were inaccuracies in the software engineering solutions provided by Henry and his group, which resulted in obtaining a low mark.

Each of the learner reflections on their experience in the group is presented around 5 sub questions based on the research questions presented in 0 and built around the three key research themes: **tutor**, **technology** and **collaborative learning**. Each learner's reflections are presented in turn and include a discussion after each learners' experience.

6.3.11 Student 1: Mary

What technology did students choose to use of those provided?

The learners in this group chose to use some of the facilities provided by the university MLE including the group area, and the discussion forum. In addition to, Web 2.0 technologies: Wiki, Jumpcut, and Blogs.

What technology did students choose to use in addition to those provided?

This group used Microsoft Messenger (MSN) to communicate and interact. In addition to hold group meetings when not on campus.

What learning approaches did learners adopt?

This group of learners decided to video a telephone interview between the project manager and the client and then another interview with all members of the group taking their roles.

“The phone interview was designed to allow us as a group in a scenario created by student 1, [to] actually find out what the required system needs to do”.

What were the learners' views on using technology?

The following comments relate to learner experiences and views of using the various technologies such as collaborative video editing software 'Jumpcut', the university MLE (known as StudyNet), the Wiki and other technologies used such as MSN which was not provided for this study.

"Jumpcut was very useful because it allowed us to create 3 videos and compile them into 2 videos." "I haven't really mentioned Studynet (the university MLE) but actually I use that quite a lot in this project...It's very useful to look through the coursework discussion area because you can find answers to questions you hadn't thought of asking!"

"I put up the Specifications Doc to the Wiki because it is easier to use as a collaborative document there, rather than on Studynet. We are all going to add our ideas and suggestions to it. I normally find Studynet very easy to use but in this case I must say that Wiki does win out"

"The [MSN] meeting on Thursday was useful...Anyway we went through the agenda and covered all that we set out to discuss"

"It is useful to have an agenda because it seems much easier to go off track when we are online...I wonder if the act of typing, which slows things down, doesn't set the same kind of protocol that talking does...It might be worth seeing if setting an order of typing would produce a more directed meeting."

What was the Quality of the Learning Experience?

On recording the interviews to undertake the core task Mary commented:

“It was fun and a great way to get to know each member of the group better. This makes the group feel like a community and when it comes to items like recording interviews it is fun to act the part but also helps communication in the group itself.”

On using the Blogs Mary commented:

“Anyway having looked again at our progress this week, maybe it’s not as depressing as I thought. This is another advantage of writing a [b]log, it does clarify things and it lets you focus on what has actually been achieved and what needs to be done.”

On using the Wiki Mary commented:

“We were initially going to put up our research files and links into the group area as there were some worries within the group that publishing them on the Wiki would mean that other groups who hadn’t done the work would “pinch” them”.

“Although I can understand the feelings behind this, it doesn’t lead to an open learning environment, where we all collaborate. Being put into groups and tasked with working on the same project will tend to make people competitive and protective of their work.”

What did students learn?

“Generally I think that we have found working on-line more difficult than meeting face to face, but in industry it is more and more important to be able to communicate remotely like this, especially if you work for large multi-site organisations.”

“I think that we have developed as a group and learnt how to get along as well.”

“This is the end of this Blog and has to go and print it up. I will spend some time over the next week thinking of things that we did well and trying to think of what we can do better next time around. I have learnt a lot from this project from using MSN to publishing items to the Wiki.”

“It just goes to show that we can communicate remotely and it’s almost second nature now.”

6.3.12 Discussion

Mary is an example of a student who showed real enthusiasm and was highly motivated by using the various technologies including the Wiki, Blog, and video edited jointly using Jumpcut, the university MLE, the group areas and discussion forum to complete the assessed learning activities. Mary’s

Blog provides in-depth as well as thoughtful reflection on the collaborative experience. Mary is a high performing student who gained 97% obtaining the highest grade across the cohort of learners and within the group used web 2.0 technologies for the first time and made known to the tutor that it was a real learning curve, nerve wracking at times (such as engaging in video production) and a rewarding experience. Mary found using the freely available software Jumpcut to be useful for jointly compiling and editing video. Mary enjoyed recording the videos *"it was fun and a great way to get to know each member of the group better"*. The MLE was used a lot, particularly to look through the coursework to find answers to questions *"you hadn't thought of asking"*. This refers to the discussion forum used by the tutor with students from the beginning of the module and used throughout the assessment by learners to post and respond to postings (see 3.3.2 in Chapter 3). Mary also found meetings with her group over MSN to be useful and focused around an agenda in order to keep on track and reflects how in MSN *"... order of typing would produce a more directed meeting"*. Mary found using the Blog and the process of reflection helpful as Mary reflects to *"clarify things and it lets you focus on what has actually been achieved and what needs to be done"*. However, there was evidence to suggest that group members were protective of work and reluctant to contribute research to the Wiki as *"...some worries within the group that publishing them on the Wiki would mean that other groups who hadn't done the work would "pinch" them"*. Overall, there was evidence to suggest that Mary felt part of a learning community: *"This makes the group feel like a community..."*It is

evident from Marys' experience of this study that Mary's group embraced interactivity and collaborative learning even though as Mary commented "*it was quite nerve racking to sit and act out the roles*" referring to the video recording whilst undertaking the core learning task. Furthermore, Mary comments, "*I have learnt a lot from this project from using MSN to publishing items to the Wiki.*" "It just goes to show that we can communicate remotely and it's almost second nature now".

6.3.13 Student 2: Jack

What technology did students choose to use of those provided?

This group used Wiki, Blogs and podcasts.

What technology did students choose to use in addition to those provided?

MSN used for online meetings. Jack found the online MSN meetings a difficult experience and had mixed views on using the technologies used and provided to support the collaborative experience.

What learning approaches did learners adopt?

This group decided to record a podcast of an interview between the client and developers using a microphone and PC. They booked a room in the Learning Resources Centre and hired a microphone. There were some

difficulties using this method and a fellow student came to the rescue by loaning the group his own digital voice recorder.

On the whole this group seemed to find the experience of recording the podcast rather problematic. They were able to successfully record their interview but transferring the file from digital recorder to PC was time consuming. Jack reflected on the experience as shown in Figure 6.17.



Group Blog

Group 7 used podcast as our method of capture. I think this was interesting of the group as pod casting is rife in the world we live. Ricky Gervais' podcasts were some of the funniest things I have heard and I am often guilty of looking at podcasts for my favourite tv programs or even sporting events. This brings the technology into our domain and gave us enthusiasm we needed to embrace it. I think basically from my own experience none of us particularly wished to be filmed and this was a major determinant of the medium we used. Often in the 'real' world people are unwilling to be filmed doing quite normal things without a character to play.

Figure 6.17: Podcasts: Jack's contribution making real world links using the Blog

What was the quality of the learning experience?

"The group have met over MSN and face to face where we have discussed the project ...MSN is not really my favourite pastime so I

found this a little hectic at first and would certainly not like to have used it too often as a means of meeting up with groups of people”.

“Wiki has been the area for the group to leave and work and pick it up again. I found the blank setup of the pages both positive allowing us to create a format that we found acceptable. However this was simultaneously a problem for me as I like structure”.

“The Blog was interesting because I’ve never done one before. But I felt instead of writing what I thought of people I would rather say it to their face, I felt like I was talking behind peoples backs in a way”.

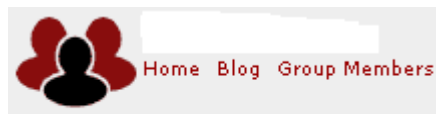
What did students learn?

“The group assignment itself taught me to work with individuals I’ve never met and I think the results are very positive, it’s very easy to slack off when you’re working for yourself, but when you’re concerned about other people’s grades as well as yours you seem to want to work a little harder”.

Overall, within the group, fluctuating levels of commitment raised many issues and on the whole the group did not have the sense of community that other groups achieved. Although in later reflections, as shown in Figure 6.18, indicate a learning community. Jack reflects:

“I am disappointed with my own effort... For example the Blog is in effect an easy piece of work in principle, but I have neglected it due to my uneasy feelings towards the whole process of reflection”.

“The use of MSN is not an area I particularly enjoy ... I am hugely aware of what you can miss in these environments in the form of body language. These important aspects of communication are not even close to being represented by ‘Emoticons’. I seriously detest these little smile faces or winks etc”.



Group Blog

The learning community was created and marshalled essentially by ourselves. By posting I felt a part of that and feel that my posts were relevant and this is what makes us able to say we participated and felt like a piece of the jig saw.

Figure 6.18: Jack's reflections in the Blog on learning community

6.3.14 Discussion

There is evidence to suggest that Jack's group used the institutional resources including a room in the learning resources centre to record a podcast and borrowed a microphone to do this. When this became problematic another of the students provided their own digital voice recorder

to help produce a podcast. Jack found using alternative media, particularly the students own MSN, something of a strain. He particularly disliked the use of emoticons *"I seriously detest these little smile faces or winks etc."* Jack also felt uneasy writing a Blog as he stated he would rather talk face to face with group members and expressed *"uneasy feelings towards the whole process of reflection"*. Jack's comments were the strongest contrast to those of Mary, highlighting some of the negative feelings online working can elicit. However, Jack did feel part of a learning community as he states: *"the learning community was created and marshalled by ourselves. By posting I felt part of that..."* He goes on to say *"...and felt like a piece of a jigsaw"*. This suggests Jack fitted into the group and recognised that, in order to fit, he had a role to play within the group. There is further evidence to suggest that Jack learnt to work with others in a group and understood the interdependency within a group: *"the group assignment itself taught me to work with individuals..."* He goes on to say *"...it's very easy to slack off when you're working for yourself, but when you're concerned about other people's grades...you seem to want to work a little harder"*. The next section presents Henry's experience of working in a group supported by technology.

6.3.15 Student 3: Henry

What technology did students choose to use of those provided?

This group used Wiki, Blogs, and Jumpcut to support the collaborative experience.

What technology did students choose to use in addition to those provided?

This group used their own mobile phones and MSN. Henry also used a photographic collage of the week-by-week group meetings.

What Learning approaches were adopted?

For the task of identifying user needs this group planned to use a two-stage process using an informal brainstorming session and a more formal interview using a story-line. The group showed a good understanding of the limitations of each method.

The group used Jumpcut to edit the recordings they made. It was regarded as a good tool that promoted the group's creativity and enabled them to make the most of what proved to be a rather poor recording by the mobile phone. Using Jumpcut the group was able to produce a more polished, professional looking end product.

They chose a digital camera to capture the process. When the camera proved problematic they switched to recording using a mobile phone. Henry reflects;

"... we have finished our recording this afternoon. It went well in the end but started disastrously. We decided to capture the client's requirements by recording with a camera and using a brainstorm, the

first recording went extremely well and we thought we had captured all the requirements really well. However, the first recording did not record and so we had to start over. The second recording recorded only three-quarters of the meeting and this became quite frustrating as we felt that both recordings were really good. The third recording we decided to use a phone which recorded us without problems. I need to double check it but hopefully it all works now third time lucky!!!!!!”.

What was the quality of the learning experience?

The reflective Blog indicated that overall Henry felt the whole experience of making the recording was positive and enjoyable. Henry reflects:

“I think the group began to bond best when we did the recordings as I have stated in my Blog it took us three attempts before we finished and this took us through until very late in the evening. We had all had lectures all day and instead of getting angry we all had a laugh about it which I thought was good as we were all committed to getting the recording done well”.

The Blog also proved to be a good reflective process, allowing the student to assess their progress and offering a good incentive to complete tasks on time. Henry reflects:

“The Blog provided me with an insight into my own progress, it enabled me to look back a week and realise if we had progressed as planned and completed tasks we set”.

"I also started on my Blog in week two. I was a little disappointed towards the end as I realized I had done the Blog wrong. Instead of adding a new entry every week I edited what I already had add in my weeks week by week".

On using Jumpcut Henry reflects;

"I personally found the Jumpcut process a superb means of creative learning and really enjoyed it".

"We found Jumpcut a really useful tool which allowed us to further develop our knowledge of completing work using an array of different techniques... We thought Jumpcut allowed us to improve what we had recorded it helped us in putting some important finishing touches. Many of us never new Jumpcut existed and I think it will help to improve our creativity with future projects".

Overall Henry agreed that a combination of new technologies suited his group and were useful tools for the continual exchange of ideas between group members with timetables that did not always allow face-to-face meetings with all members.

What did students learn?

Henry learnt the importance of good communication between members of what was a fairly large group of people who had not worked together before.

Henry reflects:

“I think that having used these tools now it has given me an insight to the importance of communication between people who are working together on a project and really how essential it is”.

It also provided Henry with some insight into the value of experience using these tools and methods in a commercial environment. Henry reflects:

“I can really understand why so many companies would want these tools available to their staff. I believe it to be a real asset to anybody who needs to communicate with people fast and regularly”.

Furthermore Henry commented on the sense of community they had between group members and with other groups on the course through using the Wiki. Henry reflects:

“I think that the Wiki helped us not only as a group to communicate but to show us a different concept of working together. I think that throughout the project I felt part of a community”.

“As a group we used the Wiki to help us communicate with one another. We also used it to communicate with other groups to offer advice and feedback”.

6.3.16 Discussion

There was evidence to suggest that Henry was sufficiently stimulated to undertake the learning activities using the Wiki working within his group and communicating through the Wiki across groups. There is further evidence to suggest that Henry learnt to work with others in a group and across groups and understood the interdependency between groups. Henry reflects *“I think that the Wiki helped us not only as a group to communicate but to show us a different concept of working together.* Henry goes on to show an understanding of *“...the importance of communication between people who are working together on a project and really how essential it is”*. There is evidence to suggest that Henry felt part of a learning community: *“I think that throughout the project I felt part of a community”*. Henry also demonstrates the link between industry, the use of technology and learning: *“I can really understand why so many companies would want these tools available to their staff. I believe it to be a real asset to anybody who needs to communicate with people fast and regularly”*.

Additionally, Henry’s group used a range of technologies including their own mobile phones and MSN for recording and communication and valued the freely available web 2.0 Jumpcut for editing the video produced and showed how active engagement in the recording task helped build the group dynamic: *“I think the group began to bond best when we did the recordings”*. There was evidence to suggest that Henry’s group showed real commitment to task achievement in spite of difficulties with recordings which resulted in them working late into the night: *“it took us three attempts before we finished*

and this took us through until very late in the evening. We had all had lectures all day and instead of getting angry we all had a laugh about it which I thought was good as we were all committed to getting the recording done well". This suggests a positive relationship between group members and task achievement.

6.4 Discussion

The previous sections presented findings arising from the practice of blended learning. This section takes forward the preliminary discussion and discusses the findings in relation to the conceptual framework in Chapter 2.

There is evidence to suggest that there is a clear role for the tutor in the practice of blended learning to guide learners through the process of collaborative learning through assessment. Evidence suggests the need to consider how students will be supported online. This study used a social constructivist approach to teaching, the emphasis on co-produced artefact and knowledge building through interactions with others in the learning environment.

6.4.1 Learners' engagement and participation

By design, the learning activities set by the tutor had emphasis on authenticity (Gupta, 2004), interactivity and collaboration (Dillenbourgh, 1999) and learning by doing (Race, 1994). The findings show that there is

clear evidence of learners' engagement and participation in the learning activities during the collaborative experience using the Wiki. It was particularly noticeable that learners grew ever more confident as the weeks went by and developed a support network. This indicates an important facet of the way learners want to learn, this clear need for interaction, along with a very strong preference for a support network.

"The group assignment itself taught me to work with individuals I've never met and I think the results are very positive, its very easy to slack off when you're working for yourself, but when your concerned about other people's grades as well as yours you seem to want to work a little harder" (Jack).

[The Wiki] *"It has also enabled us to have a common place where we can each go if have a problem allowing us to speak online if we are having problem individually"* (S35).

It was evident that learners mutually negotiated and agreed on aspects of their collaborative learning experience using the Wiki. This evidence suggests that those learners perceived that each group member was responsible for the 'good of the group' when collectively agreeing ground rules, social policies and working practices.

"attend regular meetings" (S2).

"discuss all ideas" (S7).

"involve everyone in the discussions" (S10).

Similarly, Lewin (1951), when referring to group learning, argues that learners in a group must accept the interdependency between the relationship and overall success of the group. Social policies were also found to be an important component in online community learning (Preece, 2001). Wenger (1998) purports that respect is a key characteristic of a community of practice and respect was cited by the majority of learners as important in their ground rules for engaging the group in their learning.

“respect each other’s opinions” (S1).

“use the online facilities with respect and care” (S2).

As learners mutually negotiated and agreed to take account of ways of working whilst engaged in the collaborative experience this study shows evidence of the concept of a shared repertoire which is a key element of a community of practice (Wenger, 1998).

6.4.2 Mutual negotiation

This evidence suggests that learners mutually benefited by negotiation and agreement of different ways to engage whilst contributing to the group work. These are important components of a community of practice (Wenger, 1998) promoting openness, nurturing relationships, mutual negotiation, enabling engagement, forming relationships and shared repertoire - important to keep the community alive.

“I think that we have developed as a group and learnt how to get along” (S59).

“look to help each other when help is needed” (S2).

“so if I put my idea forward in text, images or diagram and am not correct someone else in our group can edit it” (S5).

“you can find answers to questions you hadn’t thought of asking!” (S30).

Similarly, Bower et al (2006) found that learners when using a Wiki for task completion promoted negotiated meanings and that task authenticity had an impact on the student learning experience. Thus it is suggested that the tutors should think through the task requirements and ensure that the tools on offer are appropriate to facilitating the completion of the tasks.

6.4.3 Sense of community

There was evidence to suggest that the tutor approach motivated learners to engage in the collaborative experience, fostering ownership and collaboration, which helped in the formation and development of a learning community.

The reflective Blogs provided insights into the learner experience of using technology to support the group based assessment. An analysis of the results in study 1 divided the responses from each student group in relation to how they felt the technology, processes and learning experience

supported either a 'Task' or 'People Oriented' approach. People-Oriented learners identified the Wiki technology as supporting the social interaction aspects of this learning environment, rather than the ability to complete the assessed learning activities, which was the dominant rationale for community of task-oriented learners. This is supported by the social constructivists' view of learning. Lave and Wenger (1991), Wenger (1998) and McConnell (2004) view learning through participation and dialogue in social contexts. The learning activities were designed by the tutor to specifically stimulate active participation between and within groups, where dialogue and practical activity converge (Vygotsky, 1978:24).

The results also highlight the importance for task-oriented learners of having the opportunity to manage their own learning and learning environment as learners cited the importance of achieving the objectives and set task in order to successfully complete the assignment within the required time, to produce effective results and pass the course. This was particularly evident in the learners' whose rationale for community was task-oriented.

Overall, the results suggest that learners perceived a sense of community and that the community had a purpose and that purpose was to support them in undertaking their learning, both to support them as people and the tasks set by the tutor for the collaborative experience. There is evidence to suggest that learners valued the opportunities through the learning design and associated materials set by the tutor to learn together, work together, share and discuss ideas, and to support and help each other.

There was evidence, in the Wiki and the discussion facilities, that learners used different means both to identify their contributions and for social purposes. These included different fonts, colour, avatars, images, personal photos and their group number as agreed by groups. These show evidence that a sense of community was promoted amongst learners (Wenger, 1978, Paloff and Pratt, 1999, Tu, 2004, Doolan, 2007a) and, moreover, a sense of belonging to a community of practice (Wenger, 1998), situated within the groups and between the groups and in the Wiki learning environment and supported by situated learning theory (Lave and Wenger, 1991).

Similarly to this study, Grant (2008), when using Wikis with learners, found that the Wiki supported the community of practice model as individuals came together in that study and developed a shared repertoire of practices, shaping the group experiences and learning. In this thesis and supported by the work of Grant (2006), it has been shown that the Wiki can be seen to provide a context for participation and an artefact to act as a record of participations by individuals of that community of practice. Evidence in this study has shown that the Wiki technology provided learners with the opportunity to socially construct learning activities and was achieved through interactions and contributions to the Wiki by learners. Similarly in their work, Augar et al (2004) and Williams and Jacobs (2004) also found that a Wiki technology was useful in promoting interactivity whilst learners engaged in collaborative learning activities.

6.4.4 Zone of proximal development

It can be argued that, through participation in knowledge development with peers in the Wiki, learners reached their Zone of Proximal Development (Vygotsky, 1978). This is evident as knowledge was constructed by learners in the design, development, analysis and synthesis of problems evident in the documents, video, audio and discussions in the Wiki.

This sharing of artifact for evaluation, reflection and feedback in the collaborative process is important to the community of practice concept (Wenger, 1978), the development of knowledge and the Zone of Proximal Development (Vygotsky, 1978) and essential to collaboratively construct social shared knowledge (Palloff and Pratt, 2005). This study demonstrates a shift in learning from a solo activity to a community of practice (Wenger, 1978) and to a sociocultural practice (Lave and Wenger, 1991). Wikis have been shown to support a knowledge community (Holmes et al., 2004).

Through the social construction of knowledge it was evident in this study that deep learning and increased learner understandings were the result of the teaching and learning design comprising a social context which embedded social interactions and collective negotiations and participations with learners and teachers alike. In the reflective Blogs there was evidence to suggest that the majority of learners reflected on their understandings and learning with peers and that this learning was reinforced internally when the individual learner was studying alone, for instance when writing the Blog. According to

Dillenbourgh (1991:5) when “...one talks about learning from collaboration one should also talk about learning from being alone”.

6.4.5 Sharing resources

Evidence of another important characteristic of a community of practice (Wenger, 1998) to promote engagement in online community (Preece, 2001; Paloff and Pratt, 1999) was evident in this study through the sharing of resources within groups and across groups. For example “*I put up the Specifications Doc to the Wiki because it is easier to use as a collaborative document there, rather than on Studynet*” (S30). Studynet is the institutional MLE.

Similarly, Minocha and Thomas (2007) in their study of collaborative learning of distance students found that three quarters of the learners completing a software development project in their study valued the Wiki for collaborative learning. In earlier work examining online learning Tu (2004) found that, through online engagement, learners shared knowledge, negotiated and managed their own learning needs.

6.4.6 Mimicking of behaviour

There was evidence that for some (one group) the recording practice mimicked the tutor practice as the tutor provided a video recording edited using freely available Web 2.0 Jumpcut software. There was also mimicking

behavior evident in the sharing of resources particularly evident when learners shared research findings, given 8 out of 10 learner groups followed the structure composed in the Wiki by Group 12. This mimicking of behaviour is supported by Bandura (1977) who reports that when observing other people in a social environment such as carrying out the learning activities in this study, students learn from this and mimic or imitate the observed behaviour. Bandura's work also views learning as knowledge accrued by co-participation.

6.4.7 Clear expectations

Biggs (2003) specifies the need to make clear to learners the teachers expectations of learners to support learning. In this study there was clearly evidence to suggest that learners themselves engaged in a dialogue making clear their own expectations of each other in their group. Similarly, Dillenbourgh (1999); Lewin (1951); Brown (1998) found that students themselves set clear expectations with themselves, and other group members, and with the learning environment (Wenger, 1998).

Time was also an important expectation in the ground rules set by the majority of learners.

“Complete the tasks on time” (S22).

“Update Wiki daily” (S23).

“...deadlines will then be set for the week” (S24).

“Inform the group in sufficient time...” (S3).

Time on task (Chickering and Gamson, 1987) was evident in the ground rules set by the majority of learners; additionally it was evident that time was spent in face-to-face and online meetings. Face to face learners met during the normal study hours of 0900-1700 hours and late into the evenings.

“we met up again at 9:30pm even though we had met up earlier at 3.00pm”(S20).

“the reason for this second meeting was that not all of the group could make it for the first meeting, so we thought it would be vital that we make a second meeting where all members are present to talk about exactly what was done in the first meeting...” (S20).

6.4.8 Balance with face to face meetings

Remotely, the majority of learners used Instant Messenger for meetings and the Wiki to co-author and share content.

“The [MSN] meeting on Thursday was useful” (S30).

The group have met over MSN and face to face where we have discussed the project (S59).

“I have also found that working online has helped the fact that we can meet at a particular time which sometimes can be impossible in a face-to-face meeting” (S40).

“I think Wiki has made our work easier as when we can't meet in person we are able to use it as a place where we can continue the work without meeting in person and has also helped us finish some of the tasks easier and quicker” (S55).

This suggests that Wiki use needs to be balanced with face-to-face meetings and other technologies in order for the group to function well. Similarly Mackey (2007), when using a Wiki, found that learners met face to face. Mackey's work goes on to report that using a Wiki alone did not promote effective learning in students. The use of MSN suggests learners' need for immediacy of response and the need for learners to choose technologies that are 'fit for purpose' and effective to support learning. Immediacy of response and interactivity was found to be important to learners (Canole, 2002; Canole and Dyke, 2004). Similarly Oblinger (2005), who describes the 'Net generation of learner', found that immediacy in interactivity is a key component in the learning process for this type of learner. Learners in this study are deemed to be the 'net generation' (0). Although the majority of learners chose to use MSN as their preferred mode to meet, this technology does not suit all learners. *“The use of MSN is not an area I particularly enjoy ... I am hugely aware of what you can miss in these environments in the form of body language. These important aspects of communication are not even close to being represented by 'Emoticons'. I seriously detest these little smile faces or winks etc” (S33).*

6.4.9 Flexible learning

Flexible learning through technology is supported by Doolan et al (2006). In this study three courses used various technologies including institutional MLE Wiki and Blogs to support collaborative learning in a blended learning mode. Students reported that these provided opportunities to support their study when, where and how they preferred convenient to their needs.

6.4.10 Learner as facilitator

This notion of teacher as mentor (Laurillard, 1993) and facilitator (Palloff and Pratt, 2005), driving the teaching process (Biggs, 2003) was evident in learners in this study who clearly played a key role in guiding and nudging learning.

“Can we add this to the agenda for our first meeting?” (S30).

The learner goes on to direct the group:

“We need to set a date fairly soon, as we have to decide what method we want to use to get our requirements” (S30).

6.4.11 Self-regulated and authenticity

Learners were self-regulated as shown by the wealth of shared artefact in the communal space in the Wiki. The concept of a self-regulated learner in

assessment is supported by Nicol & Macfarlane-Dick (2006). This was clearly evident in those groups who identified their own need to seek and find information to help them in undertaking the learning activities beyond the resources and expectations of the tutor and relevant to their experience. Authenticity in learning (Gupta, 2004) was evident as the students related their collaborative experience to a real world context i.e. their own and the subject professional context.

“The research began by looking for information and examples of good HCI” (S19).

“We think that this will help us in creating a system relative to the user needs” (S20).

“...we thought that this site was relevant to the task as although it is only for hiring child-minders we felt that this was a good example” (S23).

“As part of my role as Systems Analysis I did some research into the position itself I found a useful website below which highlighted a lot of important roles I didn't know before” (S24).

There is evidence that learners sought references to help develop concepts and understandings and that this accrued by making evaluations and comparisons between alternatives, relevancy and application to their learning and was shared with others in the Wiki. Similarly, Canole et al (2006) found that undergraduate students in their study developed new forms of

evaluation skills that enabled them to critique and make decisions regarding new content when using Web 2.0 applications such as Wikis.

6.4.12 Quality of the learning experience

Overall there were more positive comments made by learners in the reflective Blogs than negative comments relating to the collaborative learning experience. The negative comments suggested that learners found online working more difficult than meeting face to face. Hence these learners supported the online experience with face-to-face meetings. Some students showed concern about publishing materials on the Wiki for others to share.

This sense of 'competitiveness' is supported by work undertaken by Doolan and Barker (2005) who describe how learners in their study were concerned about leaving posts in an online discussion for the next year's cohort of students.

However, positive comments showed a rich learner experience *"I have learnt a lot from this project from using MSN to publishing items to the Wiki."* (S40).

"It just goes to show that we can communicate remotely and it's almost second nature now" (S40).

6.4.13 Creative learning

The majority of learners combined technologies to suit their learning in creative ways. This indicates an important facet of the way learners want to

learn, this clear need for fun, along with a very strong preference for being creative whilst developing in understanding of subject matter.

“We found Jumpcut a really useful tool which allowed us to further develop our knowledge of completing work using an array of different techniques” (S33).

On recording the interviews using a mobile phone and edited using Jumpcut:

“It was fun and a great way to get to know each member of the group better” (S23).

“I personally found the Jumpcut process a superb means of creative learning and really enjoyed it” (S40).

Overall, this study showed how learning involves participation or engagement with others in a community and the importance of relationships with peers. There was evidence to suggest that learners understood the group interdependency in task completion. The tutor approach adopted was front loaded in terms of tutor time, by setting the learning agenda, providing detailed instructions, learning activities, templates, resources and materials for learning. After having presented these to students the tutor would then step back. However learning was facilitated through class based contact and the discussion forum housed on the MLE. Contact between the tutor and the learner (Chickering and Gamson, 1987) is regarded as good practice in undergraduate education. There was evidence to suggest that this approach which involved communicating clear expectations to the learners from the

outset resulted in high levels of student motivation and engagement. Indeed there was evidence to suggest that learners were sufficiently stimulated and intrinsically motivated, as they set up their own learning expectations and produced artefact and other content, playing roles necessary for industry beyond that specified by the tutor for the assessment. Intrinsic motivation in the group has been shown to motivate students to complete tasks (Johnson, Johnson and Smith, 1991). It can be argued that the five set learning activities in this study had a positive impact on the learner experience as these were designed to be inter dependent and divisible by the number of group members (Doolan et al., 2006) and structured to ensure each group member had a job to do (Crook, 2003) which was authentic and plausible (Canole, 2002).

In this thesis the tutor designed a 'mix' or 'blend of face-to-face and online activities. There was evidence to suggest that the blend used maximised the pedagogic opportunities afforded by each methodology and required curriculum redesign, including a review of assessment practices to ensure aligned teaching as suggested by Biggs (2003). This approach was shown to require commitment and an up-front investment in tutor effort and time. There was evidence to suggest a need for staff development both pedagogical and technological.

Despite some negative comments learners overall had a positive attitude to using the Wiki for undertaking the group based assessed tasks. The data derived from the reflective Blogs provided evidence of the kinds of learner engagement with the Wiki and the learning process. This is an important

measure of learner use of the Wiki to support collaborative working and learning and a sense of community. Learners valued the Wiki, in particular the opportunity to work on tasks any time any place and at their own pace. They valued the opportunity for reflection before responding to others and liked that Wiki kept a record of these reflections as important in their learning. Learners valued the communicative aspects that Wiki affords *“so if I put my idea forward in text, images or diagram and am not correct someone else in our group can edit it”*.

A few learners showed concern about the lack of ‘true’ responses, facial expressions, and that others may misinterpret edits to Wiki. However, overall the results in study 2 suggest that the group process was indeed supported by the various technologies provided including Wiki, Blogs, podcast and video in addition to the MLE. There was evidence to suggest that technologies such as Jumpcut enabled learners to jointly co-create, and co-produce video. The Wikis enabled learners to share their views and ideas, connect and contribute to the group process. There was also evidence to suggest that learners used their Blog to review, take stock and learn from the group process and that the Wiki was used to provide feedback on other group products in-groups and between groups such as video linked to Wiki contributions.

The data derived from the reflective Blogs in study 2 provided evidence of the kinds of learner engagement with the different technologies and the learning process. There was evidence to suggest that web 2.0 social software supported the collaborative learning experience. It was also evident

that learners adapted approaches and chose to use technologies and methods that were most appropriate to support their learning and 'just-in-time' to undertake their learning activities. Evidence provided suggests that learners used their own resources to undertake the recording for the core task as 8 out of 10 groups used their mobile phone, with the majority of groups using MSN in addition to the technologies provided to undertake the group based assessment. Few groups (only 2) valued the podcasting facility on offer, using this for recording, supplemented by a script in the Wiki. Half the groups (5 out of 10) in addition to creating a video provided an additional transcript to supplement the video. Some stated problems with the sound quality and the lighting; this may have been due to the conditions under which they were recorded such as the time of day, location and fact that they were using a mobile phone. Arguably, this study provides useful insights into the needs and expectations of today's learner and how, as tutors, we can redesign curriculum and adapt learning and teaching practices to accommodate the 'The Net generation' learner (Oblinger, 2005) and the 'Digital Native' (Prensky, 2001).

This study has shown that learners developed in imaginative ways their collaborative working skills, problem solving, critical analysis and the full range of transferable skills necessary for employment. Thus there was 'real' evidence that the underlying philosophy of the Computing programme was 'nurtured' by using a Wiki as part of social constructivist pedagogical practice helping learners to continue to learn, to be adequate and confident

communicators in the widest sense and to make an active and constructive contribution in their working environments. This was an important outcome of this study. Moreover, there were insights that the overall learning objectives on the module were supported by using a Wiki. In particular, the application of software engineering practices, from problem identification through to implementation and evaluation processes, requiring decisions to pursue chosen approaches within the context of a collaborative working environment in a team environment, thus fostering and developing collaborative working skills. It is suggested that the impact of the blend in learning designed by the tutor in guiding learners through the process of collaborative learning driven by assessment which comprised the face to face and the online learning experiences were found to be key in fostering learner ownership of group work, engagement in group work and in the establishment of a learning community.

6.4.14 Learner control

In this study the online learning activities were designed to be completed individually and in groups and as an integral part of the overall module assessment described in Chapter 3 section 3.4. The assessment design was shown to encourage engagement in learning, to foster ownership and collaboration - all helping in the formation and development of a learning community and task completion as discussed in section 6.4.3. Learners were shown to collaborate in groups and actively work on the five learning activities, designed to support the both the group and individual assessment.

These could be perceived as learners in control of their own learning. This also manifested itself in the co-construction of knowledge by learners which emerged through the interactions and engagement with other learners, the Wiki technology, and the learning activities *“so if I put my idea forward in text, images or diagram and am not correct someone else in our group can edit it”* (S5). The zone of proximal development is discussed in section 6.4.4. Additionally, learners demonstrated they were in control of their learning as they were sufficiently intrinsically motivated as evidenced through collaborations, engagement and interactions with peers, the learning activities and the Wiki technology.

Moreover, learner control was clearly evident in those groups who identified their own need to seek and find information to help them in undertaking the learning activities beyond the resources and expectations of the tutor and relevant to their experience.

6.4.15 Assessment performance

The assessment design is described in Chapter 3, student performance data for both years of the study 2005 - 2006 and 2006 -2007 can be found in Appendix D. The data presented is based around the five learning activities described in section 3.2.2 in chapter 3 and the allocated marks for each task alongside the total mark for each learner and the group. Variables 0506 and 0607

Table 6.8 shows the descriptive statistics for both years of the study including the variables, means, standard deviations and total marks for the learning activities (T1-T5) for both years of the study 2005-2006 and 2006-2007 respectively.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Total0607	59	0	97	43.76	23.823
T1(5)0607	59	0	5	1.90	1.902
T2(40)0607	59	0	40	19.44	10.908
T3(20)0607	59	0	20	6.69	5.808
T4(20)0607	59	0	17	8.83	4.073
T5(15)0607	58	0	15	7.02	4.770
Total0506	94	.0	98.0	42.957	21.5046
T1(5)0506	94	0	7	4.36	1.520
T2(40)0506	94	0	40	21.91	12.095
T3(20)0506	94	0	20	6.90	5.484
T4(20)0506	94	0	18	7.68	5.480
T5(15)0506	93	0	15	6.29	4.589
Valid N (listwise)	58				

Variables 0506 and 0607

Table 6.8: Descriptive Statistics; Means and standard deviations for tests Total and T1 – T5 for both years

The results of an independent t-test is shown in Table 6.9 and shows there was no significant difference between the two years of the study $P=0.83$ and the total marks achieved by learners.

Independent Samples Test		
	Levene's Test for Equality of Variances	t-test for Equality of Means

									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
TESTSCORE	Equal variances assumed	.043	.836	.216	151	.829	.805	3.724	-6.554	8.164
	Equal variances not assumed			.211	113.914	.833	.805	3.813	-6.748	8.359

The result shows no difference between the performances in the two years. P=0.83

Table 6.9: Independent samples test (t-test)

Table 6.10 shows the performance data for each group for both years of the study 2005 - 2006 and 2006 – 2007.

Group Statistics					
	Year	N	Mean	Std. Deviation	Std. Error Mean
TESTSCORE	1	59	43.76	23.823	3.102
	2	94	42.96	21.505	2.218

Year 1 = 2006-07 Year 2 = 2005 06

Table 6.10: Group Statistics

6.5 Conclusion

This chapter presented a discussion of the findings of both studies arising from the design and implementation of a blend of online and offline learning using a Wiki and class based learning environment and associated materials as detailed in Chapter 3. Evidence of findings was presented around the three key research themes: **tutor, technology and collaborative learning** presented in 0 in order to answer the research questions. Evidence suggests that there is a clear role for the tutor in the practice of the design and

implementation of a blended learning experience by guiding learners through the process of collaborative learning through assessment and that the use of technology to support collaborative learning made a positive impact on the learner experience. Findings showed the Wiki supported community and collaborative aspects of a sociocultural practice. The chapter concluded with a discussion of the findings related to the literature of the conceptual framework in Chapter 2. The next chapter draws together the research and presents a discussion on the implications of these findings related to the thesis and based around the conceptual framework in Chapter 2. Suggestions for future research are considered.

Chapter 7 Conclusions and future work

This chapter draws together the research and presents a discussion on the implications of the findings in Chapter 6 related to the thesis and based around the conceptual framework in Chapter 2. Suggestions for future research are also considered.

7.1 Original contribution to practice

This thesis offers an assessment design for collaborative learning, utilisation of blended learning support through current communication technologies and highlights the crucial role of the tutor. The thesis designed and tested a theoretical framework which encompassed an active learning environment and resulted in the development of the shamrock conceptual framework.

To test the theoretical framework, clarify the role of the tutor and the impact on the learner experience two studies were undertaken using pedagogical models that combined the concepts of learner-centric, sociocultural and dialogic perspectives on collaborative learning and technology in meeting the needs of learners in the 21st Century.

In the first study, the role of the tutor was found to be essential in setting, implementing and guiding learners as part of a social constructivist pedagogical practice. The pedagogical approach adopted was to blend face-to-face and Wiki learning experiences and was found to be key in ensuring learner ownership and engagement and to foster a learning community.

The second study validated the first and provided additional asynchronous technology experiences in addition to the Wiki blend. Study 2 examined the role of the tutor and the learner whilst using podcasts and video and a Wiki in the collaborative experience.

Findings showed that the Wiki supported community and collaborative aspects of a sociocultural practice.

The importance of technology design and use to accommodate collaborative and community aspects was found to be key. It was found that technology is not simply an add-on but rather needs to be planned and considered purposefully by both tutors and learners when used in a blend to supplement learning on campus in Higher Education. This study has shown for this to happen academics need to be provided with the appropriate support, knowledge and skills required in developing a blended learning experience using a Wiki supplemented by class contact on campus.

7.2 The need for this research

The design, development and implementation of a Wiki and face-to-face learning environment were in response to the needs of learners studying on the Information Systems Development module. Previous studies had shown a heightened need for a more 'organic' technology; one that enabled learners and tutor alike to develop content, hence the use of a Wiki. The findings in this thesis will add to the debate across the HE sector on ways to meet the needs of the net generation, to work towards narrowing the perceived gap

between teachers' and learners' use of technology, especially by the pre and post digital age generations, and in listening to and acting upon learner views.

To this end, the conceptual framework set out in the literature review in Chapter 2 influenced the role of the tutor and the design for the collaborative experience, technological and face-to-face, detailed in Chapter 3. The design themes set out in Chapter 3 were intended to shape the development and implementation of the Wiki and face-to-face learning environment. The intended outcomes of the designs were to understand the three key research themes: **tutor**, **technology** and **collaborative learning**, which were based around the research question

How can technology be used to support learners and teachers in collaborative learning through assessment?

Hence the original contribution made to practice through this thesis is to clarify the role and impact of the tutor in supporting student learning through the use of a Wiki application. Chapter 3 argued that there is a clear role for the tutor in establishing a Wiki learning environment to support collaborative learning through assessment. The role of the tutor was initially explored in study 1 (as shown in practice in Chapter 3) and repeated in study 2 which clarified, validated and provided guidance on how this role can be enacted as this area of practice develops further. This was achieved through a practical example of using a Wiki in the learning design and adaptation to curriculum which was deeply rooted in social, collaborative, community, and learning theories and the principles of 'good teaching and learning practice' for both

technology and face-to-face learning. These learning theories and concepts were validated through the practice designs in Chapter 3. Through this thesis the argument is made that, when used in this way, a Wiki is a learning resource to support collaborative learning through assessment.

The findings and discussion of findings of this research were presented in Chapter 6. This chapter concludes the findings of the study related to the conceptual framework presented in Chapter 2 and based around the key research themes **tutor, technology and collaborative learning** to answer the research questions presented in 0. Thus this concludes the response to the research question.

7.3 The conceptual framework

The thesis designed and tested a theoretical framework which encompassed an active learning environment and resulted in the development of the shamrock conceptual framework illustrated in Figure 7.1. This is based on the scholarly works presented in Chapter 2 that underpinned the research in this thesis. The initial shamrock was presented in Chapter 2 in Figure 2.3. The inter connections between the shamrocks' three leaves in Figure 7.1 bears the three concepts: Pedagogy, Learner and Tutor and related to the three key research themes **tutor, technology and collaborative learning** to answer the research question.

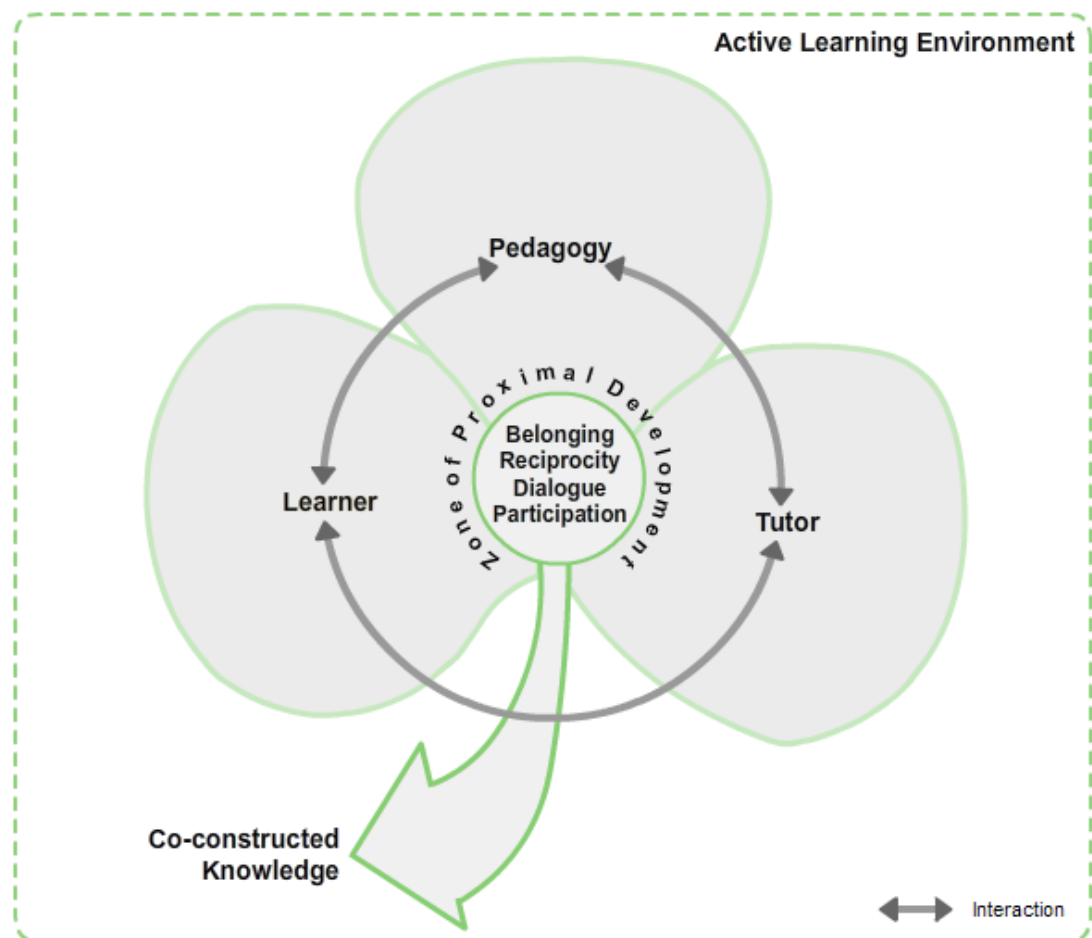


Figure 7.1: The conceptual framework

The Pedagogy in the conceptual framework in Figure 7.1 comprises a learning environment that includes collaborative, group, social, situated, and community learning and technology. This thesis has shown that **technology** can be used as part of a blend to supplement, not replace, class based learning. This study has provided two different learning blends. In study 1 in 2005-2006 a Wiki was used in conjunction with campus-based learning. Additionally a discussion forum housed on the institutional MLE was utilised from the outset of the information systems module. Both the Wiki and the

discussion facilities were found to have a positive influence on the learner experience. These provided opportunities for learners to engage and participate in social and collaborative learning situated in the social context, participating and engaging in various learning activities. The use of the Wiki was driven by the assessed learning tasks; however there was no onus on the learners to use the discussion forum. They did so out of a need to ask questions and respond to questions posed predominately by peers, which were, however, initially seeded by the tutor from the outset of the module.

The Wiki, used as part of a blend, stimulated appropriate student activity, indeed more than that expected for the assessment. Importantly, this shows that learners were sufficiently stimulated and intrinsically motivated by the learning activities and the use of a Wiki. This engagement ensured that learners were spending time on the learning activities whilst at the same time committing to the collaborative experience. Learners commented on the time spent on learning activities and that engagement with the learning activities using the Wiki and the discussion forum as part of a blend helped manage and distribute their learning. The research has demonstrated that the learning activities designed to be supported by the Wiki in study 1 were plausible, authentic and helped learners develop in understanding and concepts related to the module content and linked to industry.

In study 2 in 2006-2007 based on feedback from study 1 a different blend of technology was used as part of a blend to supplement campus based learning. This research has demonstrated the use of a Wiki, podcast, video, Blogs and the institutional MLE discussion forum and group areas.

Additionally, learners created their own blend of learning by using their own personal technologies such as MSN and mobile phones to communicate and collaborate. This research demonstrated that learners learnt in imaginative ways using the various blends of technology and face to face learning which stimulated and encouraged them to adopt an open and inquisitive approach to their learning and intellectual development; a skill which they can use throughout their lives.

The research has shown the need for an environment where individual learners feel supported, safe and sheltered and where learners support each other as they build their own learning community with high levels of motivation and engagement. This research has shown that the tutor role is a key to enabling this to happen and this can be achieved through providing clarity in communication between the tutor and learner and between learners by communicating expectations, and developing an ethos amongst all parties in learning that develops reciprocity and participation amongst learners whilst in class. This research has shown this translates well into online learning environments such as a Wiki and the discussion facilities.

This research has also shown that the role of the tutor is to foster respect amongst learners for each other and to design learning activities that encourages learners to acknowledge the range of abilities, styles, and diversity in learning. This research has shown the important role of the tutor in communicating responsibility to learners as their tutor, and to encourage learners to communicate their responsibility to the tutor and each other in designing a learning activity such as the group commitment, which was the

first assessed activity with all other activities building on this. These engagement protocols were shown in this research to help learners to take responsibility for themselves, and their own learning, whilst being sensitive to the needs of others in their group. This was further encouraged by the tutor by designing learning activities that encourage active learning amongst learners, moreover, that nudge learners to take ownership of their learning. The ethos in this research was one of being in a sheltered and safe learning environment, one that is motivating and engaging.

This research has shown that the tutor has a role to play in gaining the interest of learners and tapping into what they already know and use recreationally -in this research, social networking technologies. This research has shown that tapping into learners' existing skills and knowledge base nurtures, motivates, and sets the student on the path to discovery, whilst providing an opportunity for them to engage with and develop transferable skills such as collaborative working and team building. The underlying teaching philosophy used that of a blended social constructivist approach; the blended approach combining technologies outside of the classroom with face-to-face class-based activities has proven instrumental in learning. The research shows how through using this approach the learning is not static; rather it involves engagement, participation and a dialogue with others.

In this way, it is argued in this research, learners co-constructed knowledge in the Zone of Proximal Development (Vygotsky, 1978) as illustrated in Figure 7.1 as learners were sufficiently engaged in collective learning which involved the co-production of shared artefact such as video and podcast and

joint problem solving and meaning making and sharing these artefacts with other learners within and across groups. Thus this research has shown that learners collectively shared knowledge and skills through assessed individual and group based learning activities. This approach was shown in this research to provide an opportunity for learners to develop authentic situated learning, authentic meaning, “real life” experiences, situated in contexts and situations that would normally require knowledge through social development. This was a direct impact of the design for learning set by the tutor who set “real world” problems that needed solving in groups to evoke student motivation as described using the tasks presented in this thesis. The tutor then used social networking technologies to help shift the emphasis from the tutor to the student.

This research has shown that the social constructivist perspective (Vygotsky, 1978) is supported by social networking technologies wherein activities set by the tutor encouraged peer-to-peer support and critical analysis of each other’s works and was shown to support interaction and collaborations as described in this thesis. This social constructivist environment places the emphasis on the learner.

In this way, this research has shown that online social software can be used as a learning resource to shift the emphasis from the tutor to the student, and as a tool for collaborative learning enabling students to acquire the necessary skills for the workplace and at the same time personalise their own learning. However, the rapid pace of the emergence of social networking technologies raises a number of pedagogic challenges and

opportunities for academics and staff developers. If we are to meet the expectations of the net generation learner it is important for practitioners to be provided with opportunities to continuously update themselves with the increasing possibilities that these technologies afford in the education sector, and their potential to enhance knowledge development and transfer. In order to use these technologies to complement traditional class based models of teaching and learning, staff need to be provided with the appropriate support, knowledge and skills required to develop a complementary online and face-to-face learning experience. “Contact hours” need to be reconsidered, if courses are to be redesigned using the model presented in this thesis; a student-driven activity based learning approach, whereby the tutor sets up the learning environment and develops complementary assessed activities, takes preparation time. We also need to address institutional and departmental quality assurance mechanisms and processes. There is also a need to consider colleagues who are teaching different courses and their reactions. This study was undertaken on an Information Systems Development module, however much of the design has been used on other modules across the institution and therefore lessons learnt are adaptable (see section 7.8).

In Figure 7.1 the learner in the model engages in learning through discourse comprising negotiations and shared expectations with other learners and hence represents the **collaborative learning** environment and experience. This research has shown that learning activities were set by the tutor to promote interaction and participation between learners and the tutor. The

intention of the learning design was to promote opportunities for learners to create and expand their knowledge whilst problem solving collaboratively. The research has shown how the learning design provided opportunities for authentic learning activities through mutual engagement between learners and across groups with the learning activities using role-play whilst learners were situated in groups in a social learning context. Learners were shown to actively work together on shared learning goals that were work-related to enhance skills development such as team building, and working and relating to others whilst developing community knowledge.

The Tutor domain represented in the conceptual framework in Figure 7.1 views the **tutor** as one who initially designs the conditions for learning and evolves based on learner participations and interactions. In this thesis authentic learning activities were designed in a social and situated learning context where tasks and activities were designed by the tutor to promote interaction, participation and sharing amongst learners. This research has shown that the learning design creates the conditions for deep learning both whilst in groups and when learners were working in isolation for example whilst composing their reflective Blogs. Learning through collaboration and participation in this way was shown to promote a sense of belonging to a community to promote participation and mutual engagement in learning. In this way this research has shown reciprocity between the tutor, learner and pedagogy in a collaborative blended learning context. One instance of this is the development of a repertoire of shared and mutually agreed artefacts such as jointly produced video and audio and co-produced and co-authored

documents such as the assessment specification, which was adapted by groups for their own use within the Wiki.

The Wiki and face-to-face learning context was shown to provide a learning resource for learners which was progressively and continually added to, and reviewed between peers and the tutor as learning progressed. In this way, the learning repository was fed forward for use in learning designs from study 1 in 2005-2006 to 2006-2007 and subsequent years, which are not included in this research. However, a note of caution when using Wiki farms such as the Wiki used in this research; it is important to back up the content as Wikis are likely to change and have done since the outset of this research. Many are now included in institutional resources such as the university's MLE. This research has demonstrated the inter connections between the pedagogy, the tutor and the learner and that these interconnections as shown in Figure 7.1 are based on interactions amongst these parties in the learning process in order for learners to develop in the zone of proximal development. This research has shown for this to happen that learners need to feel a sense of belonging to a community, learning design needs to promote reciprocity and dialogue between parties in the learning process and that through participations learning takes place.

7.4 Responding to the research questions

The conclusions drawn relate to two cohorts of students. In 2005-2006 ninety-six learners and in 2006-2007 sixty learners used the learning design

comprising the blend of online and offline learning comprising a Wiki and campus based learning. To answer the research question the research strategy most appropriate was the case study as justified in Chapter 4. Different data sources i.e. reflective Blogs, tutor observations and reflections and learner contributions to the Wiki were triangulated in section 4.3.2 in Chapter 4. Analysis of the data shows that lessons may influence pedagogical practice across the HE sector as much of the design grounded in the conceptual framework presented in Chapter 2 has relevance across the HE sector. In exploring the literature there was a gap relating to the role of the tutor and technology use, hence the need through this thesis to bring clarity to, and provide evidence of, the impact on the role of the tutor in supporting student learning through the implementation of a learning 'blend' comprising a Wiki and a class based setting in addition to the university MLE.

7.5 Limitations of the study

Advances in technological development have resulted in the introduction of technical infrastructure including Managed Learning Environments (MLEs) and Virtual Learning Environments (VLEs) now being widely used in Higher Education. Since this research began in 2005 many of these environments now house Wiki functionality. The design of technological environments are developing and constantly evolving in the Higher Education sector to accommodate changes in the Higher Education landscape. However, educational practice has been slower to respond to the pace of change creating a gap between the educator and the learner, which in turn may be

failing to meet the expectations of this new generation of learners. This thesis is intended to help go some way to meeting that gap.

7.6 On a personal note

What is an important outcome of this research is that online social software has been shown to be used as a learning resource to shift the emphasis from the tutor to the student, and as a tool for collaborative learning, enabling students to acquire the necessary skills for the workplace and at the same time personalise their own learning. Using web 2.0 social software technologies offer a major opportunity to personalise the student learning experience enabling learners to co-create their own learning content, knowledge, and environment social constructivism. On a personal note, this study has provided valuable insights into the individual learner experiences and group processes in a system of mass Higher Education, helping me to reflect and review my teaching, learning and assessment practices whilst helping to redesign curriculum and help align learning and teaching practices with the needs and expectations of the 'Net generation of learners'. Many of the concepts and theories in the conceptual framework still remain relevant to pedagogical practices even with changes in technology and modes of delivery.

7.7 Future work

This research has responded to its original aims. The thesis has put into practice blended learning in the design and development of a Wiki application to supplement campus collaborative learning. This research has highlighted and explored the role of the tutor in guiding learners through the process of collaborative learning driven by assessment.

This study highlights the need to understand the effective blend between technology and class based contact. This would help our understanding of how much or how little technology is appropriate to support learners and teachers alike.

In this research learners put into practice their own blend for learning using MSN and mobile phones for communication and participation in the collaborative experience. It would be useful to explore how much or how little personal technology is needed to support learning and to understand which technologies are most conducive to student learning. This would help understand how we can best support learners in using their own technologies. At present there are difficulties in gaining technical support for technological infrastructure outside those provided by the institution. Thus there is a need for more studies relating to the learner experience of using personal technologies and how best to support these to help inform institutions on how best to support learners and tutors alike.

This research has shown how learners actively collaborated and participated in learning. The Wiki enabled the tutor to monitor the progress made by

learners providing a revisions feature that could potentially make visible progressive knowledge development to help tutors understand how best to support learners in this endeavour. This would also help tutors respond to misconceptions as necessary in order to enable learners to move forward in learning. A comparative study of this nature would potentially enable us to understand better the zone of proximal development as one could measure the distance between problem solving whilst a learner is working alone and this measure whilst working with others.

This research has shown how learner-centric models underpin collaborative learning with a focus on learning rather than teaching and emphasise, for example, problem solving in a social context. In contrast, tutor centric models focus on teaching. It would be an interesting study to understand the balance between learner and tutor centric models to support collaborative learning and to help understand how much participation and engagement is needed between learner-tutor, tutor-learner and learner-learner in light of the underlying concept behind social networking technologies, that of learner as co-producer; in summary, how much participation is necessary in the teaching and learning nexus.

There was evidence of deep learning in this study. The Wiki technology provides the potential to study deep and surface learning approaches by studying learner content. There are endless opportunities for research using technologies such as Wikis. There is the opportunity to study group dynamics, how groups are formed, who leads the way in which responsibilities are negotiated.

7.8 The learning designs are adaptable

The learning designs used in this thesis are adaptable. These have been adapted and used in the University where this research has taken place for instance, in the School of Electrical Engineering and in the School of Psychology. Wiki strategies developed in this study have been used in other Universities, for example the University of Staffordshire on the Postgraduate Certification in Higher and Professional Education course. These suggest that the learning designs are adaptable to a wide range of disciplines beyond computer science students.

Additionally, based on the journal, conference publications and articles (many invited) associated with this thesis in Appendix C the suggestion is implied that there is an interest in the academic community in this work.

7.9 Close of the thesis

This thesis offers a contribution to the practice of blended learning by highlighting and exploring the role of the tutor in guiding learners through the process of collaborative learning driven by assessment.

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Appendix A

Glossary

A.i Glossary of Terms

Term	Definition
ALT	<i>Association for Learning Technology</i> a membership organisation bringing together all those with an interest in the use of learning technology in Higher Education. The Association's aims are to: promote good practice in the use and development of learning technologies in Higher Education; facilitate interchange between practitioners, developers, researchers and policy makers in Higher Education and industry; and represent the membership in areas of policy such as infrastructure provision and resource allocation. The conference ALT-C is one of the major events in the learning technology calendar. World Wide Web: http://www.alt.ac.uk/
BECTA	<i>British Educational Communications and Technology Agency</i> the Government's lead agency on the use of ICT in education, BECTA plays a crucial role in helping to maximise the benefits to all teachers and learners that using ICT can bring. World Wide Web: http://www.becta.org.uk/
BL	<i>Blended Learning</i> Where face-to-face and online methods (e-learning) are combined
Blend	The combination of face-to-face and online (e-learning)
BLU	<i>Blended Learning Unit</i> A centre for the enhancement of teaching & learning at UH
Baby Boomers	Coined by Landon Jones (1980) the term describes those born in the post-war years between 1946 and 1964 that constitute the largest part of the population to fall outside of the natural technological mind-set of the Digital Native.
CIT	<i>Communication Information Technology</i>
Collaborative Assessment	Method of delivering assessment whereby learners engage with each other in the development of work towards core learning goals be where crucially peers are involved in the assessment and reviewing process of the work

CL	<i>Collaborative Learning</i> Where students work together on a task to produce a collaborative output
CSCL	<i>Computer Supported Collaborative Learning</i>
CTI	<i>Computers in Teaching Initiative</i> The last phase of the Computers in Teaching Initiative (CTI) was launched in 1989 with the mission to maintain and enhance the quality of learning and increase the effectiveness of teaching through the application of appropriate learning technologies in UK universities. In order to promote and support change in teaching practices, a network of 24 discipline-specific support centres was established with a Support Service to provide co-ordination. Each centre was hosted by a relevant university department, ensuring that the work of the CTI remained focused on the real priorities of teachers and learners. World Wide Web: http://cti.ac.uk
DFES	<i>Department for Education and Skills</i> The department of UK government with ultimate responsibility for all sectors of education. It has defined its priorities as developing and inclusive society and supporting a globally competitive economy. World Wide Web: http://www.dfes.gov.uk/
Digital Native	A person who has grown up with technology that is currently regarded as ubiquitous, such as computers the Internet and the mobile phone and for the most part see such devices as second nature as well as a natural extension of work and play (Prensky, 2001).
HE	<i>Higher Education</i>
ILT	<i>Institute for Learning and Teaching in Higher Education</i> The professional body for all who teach and support learning in Higher Education in the UK. It exists to enhance the status of teaching, improve the experience of learning and support innovation. World Wide Web: http://www.ilt.ac.uk/
Digital	<i>The opposite of a digital native. Digital Immigrants have witnessed</i>

Immigrants	the introduction of technologies such as the internet. <i>Digital Immigrants</i> have a far broader set of responses towards technology from strong resistance to being as technologically immersive as a digital native but will always in some way retain their link to their own past in their engagement with technology (Prensky, 2001).
IMS	<i>Instructional Management Systems</i> IMS develops and promotes open specifications for facilitating online distributed learning activities such as locating and using educational content, tracking learner progress, reporting learner performance, and exchanging student records between administrative systems. World Wide Web: http://www.imsproject.org/
JISC	<i>Joint Information Systems Committee</i> Promotes the innovative application and use of information systems and information technology in further and Higher Education across the UK. World Wide Web: http://www.jisc.ac.uk/
Jumpcut	Jumpcut was an online video editing, storage and social distribution technology. It supported cutting, re-sequencing, titling and effects for video clips captured on a computer webcam or camcorder. The service was brought out by Yahoo and discontinued in June 2009.
Learning Design	The process of maximising the effectiveness of learning materials and progression to meet the needs of the learner both individually and as an outcome of benefitting from engaging in a course of study (such as developing skills or competencies). Learning design seeks to increase and optimise the potential for the learner to perform and succeed.
LRC	<i>Learning Resources Centre</i>
LTSN	<i>Learning and Teaching Support Network</i> The LTSN aims to promote high quality learning and teaching through the development and transfer of good practices in all subject disciplines, and to provide a 'one-stop shop' of learning and teaching resources and information for the HE community. World Wide Web: http://www.ltsn.ac.uk/
MLE	<i>Managed Learning Environment</i>

	A web based online learning environment that links with student' results and administrative systems
Net Generation	<p><i>Also known as Generation Y or the Millennial Generation</i></p> <p>The <i>Net Generation</i> is a demographic definition for people born between the mid 1970's and the early 2000's that are defined as being familiar with the use of digital communications and technology and as such their expectations and demands from education as well as work are considered to be far more immediate and uniquely different from previous generations (Cheese, 2008).</p>
Personalised Learning	<p>An approach to pedagogical development which sees the learner as an individual within the learning environment, who seeks to fulfil their own expectations from learning and as such views the pedagogy as affording a reasonable degree of choice to the learner to suit their own learning styles.</p> <p>The emphasis for Personalised learning is to tailor "the teaching to individual needs, interest and aptitude" (Heller et al 2006) presenting opportunities and different means of reaching the same learning goal rather than necessarily providing choice in what students ultimately learn. By providing choice and direction the learner is free to create their own learning and pathway towards that goal with the support of the tutor. The growth of educational technology is seen as a key driver for the concept of personalised learning.</p>
StudyNet	The University of Hertfordshire's MLE
TechDis	<p>TechDis is a JISC funded service supporting the further and Higher Education community in all aspects of technology and disabilities and/or learning difficulties.</p> <p>World Wide Web: http://www.techdis.ac.uk/</p>
UH	<i>University of Hertfordshire</i>
Web 1.0	Describes the World Wide Web in the period from its inception in 1991 up until the rise of the Web 2.0 phenomena in 2003. Web 1.0 is a model of the web where content is consumed as a passive medium and web creation activities are predominantly the domain of the few who have the resources to capitalise upon its extended 'old media' model.

Web 2.0	A paradigm for the continuing development of the World Wide Web and the change from the Web as a place to receive information to the web as a place to create, share and exchange information as an active rather than passive medium.
Wiki	An internet technology created by Ward Cunningham between 1994 and 1995 (Leuf and Cunningham, 2001), the Wiki seeks to utilise the web browser as a method of creating, sharing and providing collaboration for information on the World Wide Web. Wiki's are considered to be amongst the most well-known of Web 2.0 conceptual tools, offering users a shared and fully collaborative environment in which contributions can be inter-linked and ideas cross-associated in the creation of an evolving body of knowledge.
Year 2	The second year of the students' programme

Appendix B

Student Guidance/Assessment Specification

Conceptual Design/Researcher-Practitioner notes

B.i Student Guidance

Guidance Notes for Students

This guide will help you and your group to manage your individual and group assessment tasks.

You will be using Wiki technology, Blogs and Module Class Discussion on StudyNet to support and complete your assessment tasks: <http://uh-isd2.jot.com/WikiHome> and will have the opportunity to incorporate the use of alternative technologies into your Wiki, i.e. Podcast, Webcam, and a place to upload, store and edit these using Jumpcut: see <http://www.jumpcut.com/>

To undertake the following tasks for this assignment, and in addition to this document, you will need to obtain copies of the following handouts: the Assignment Briefing sheet and Roles. These provide detailed instructions and guidelines to undertake this work. These instructions will also be made available during the lecture as per module schedule. **It is important to read and follow all instructions provided in Wiki and in your areas on StudyNet.** It is your responsibility to ensure you have a copy of all the materials required to undertake the assessment and that you fully understand and comply with our expectations - ***otherwise you will gain zero marks for this piece of work.*** All supporting documentation is available in Wiki on the Assessment page see <http://uh-isd2.jot.com/WikiHome>.

Note: You are required to work in a group of 6 allocated by the module leader. You are NOT allowed to change groups and will remain in this group for all your assignments unless we agree otherwise. Notification of your group number and group members is available as a news item on StudyNet and on the Group Details page in Wiki. You will also find when you access the ISD2 module on StudyNet you now have access to two groups:

1. Your private Blog bearing your name; this is private to you and accessible by your tutor Martina A. Doolan. You are required to use this to complete task 5 of the assessment.
2. Your private group area, which bears your group number.

Example: a scenario of a student named Fred Blogs. Fred wants to find out what group he is in, thus Fred looks at the News item on StudyNet, and finds he is a member of Group1. When Fred logs onto the ISD2 module on his StudyNet portal Fred will have a link to a group area called Group1. Fred will also have a link to a group called Fred Blogs. This is for Fred to use to keep his reflections for task 5. When Fred accesses the Wiki, he clicks on the Group Details page and then Group1. If Fred has forgotten his group number he can check the list attached to the GroupDetails page in Wiki. Fred now enters his private space where he can create his own learning environment in a way that suits himself and his groups' learning needs in order to undertake the set tasks. Bear in mind that at all times Fred must ensure he is meeting the instructions as set out in the documentation provided.

You will receive an email to join Wiki n later than Monday 30 October by 1700 hours and this invitation expires after 7 working days. It is therefore in your best interests to log onto Wiki as soon as you receive your email. You are required to input a user name and password: your username is your email address and your password is your choice and remains private to you. For example, my username is MartinaA.Doolan@herts.ac.uk, please bear in mind, that this is case sensitive. If you have any problems gaining

access to Wiki you are required to notify m.a.doolan@herts.ac.uk no later than Thursday 02 November. In the subject header of your email, you must include "ISD2 Problem with Access to Wiki".

Please note that once you register, these technologies may be used in whatever way suits your group needs, bearing in mind that you must follow the requirements as specified for this coursework, i.e. as specified on the documents Assignment Briefing Sheet, Roles and Guidance notes for students. You will also need a copy of the case study; this will be distributed during the lecture as per schedule and will be available in the Wiki Assessment page: see <http://uh-isd2.jot.com/WikiHome>.

I really look forward to your progress and seeing the outcome of your group work.

What you have to do:

The following tasks will include a mix of assessment, i.e. you will be assessed/marked individually and for group work. Each task identifies how many marks are allocated for each task, and whether or not it is an individual or group assessment.

This work will be carried out in groups of 6.

1. For task 2 you are required to work with another group of 6.
2. It is important that you make clear which group you have worked with.
3. Only one group is allowed to work with one of the other groups - this means that no group should be working with two groups (or more).
4. All of your work must take place using the collaborative technologies provided alternatively you can choose others however, you must let Martina know. In order to help you to meet the learning outcomes for this assessment the following technologies are provided: Wiki, group area in StudyNet, Blog, and Module Class Discussion. (*see attached coursework 1 schedule as a guide*).

To complete these tasks, you are offered a choice of method/device (see below). After making your choice:

- a) You must gain approval from your tutor, Martina A. Doolan on the Module Class Discussion *by Monday 30 October 2006* so that your tutor can support your group work.
- b) In making the case for your chosen options, you should state what you would like to use, the reason, and whether you have the resources.
- c) You will obtain approval for your chosen options if the work can be shown in Wiki.
- d) *If approval is not agreed, you will gain zero marks for that task.*

To undertake this assignment you will need to obtain copies of the following handouts:

- Coursework 1 schedule,
- Roles, Guidance notes for students.

These provide detailed instruction and guidelines to undertake this work. These instructions are also provided during the lecture as per module schedule. It is your responsibility to ensure you have a copy of all the materials required to undertake the assessment and that you fully understand and comply with what we expect of you - *otherwise you will gain zero marks for this piece of work*. All supporting documentation is available in Wiki on the Assessment page.

The following tasks are based on the “little shop of horrors child minding agency “case study, as provided.

Task 1 (Individual) – Group Commitment (5 marks)

You must complete this activity by 1700 hours 02 November 2006

Ensure that this section is clearly visible in your group Wiki area.

Submit the following details:

- Individual name and the names of other group members, e.g. I am Fred Bloggs and I am working with John Smith, Mary O’ Reilly and Peter O’ Connor. I am Peter O’ Connor and I am working with Fred Bloggs, Mary O’ Reilly and John Smith etc.
- Confirm that you have: A list of group contact details (names, telephone numbers, email addresses).
- Identify the ‘ground rules’ the group is using in order to be able to operate successfully
- Organised group meetings; this must include dates and times of planned meetings.
- All meetings must be take place on-line and are to be documented using the format:
Apologies for absence, Minutes of last meeting, Motions (list of matters discussed), Special Reports (if any), and any other business. Actions identified at meetings MUST name the person(s) responsible for carrying out these actions. Each individual student is responsible for signing and agreeing to these at every meeting. (The signed copies

must be included in the paper version of your group report). Each individual student is responsible for demonstrating in their individual reflective log (see Task 5) how they have met their agreed group commitment.

You must complete this activity by 1700 hours 02 November 2006

Task 2 (Group) - Identify Users Needs and Establish Requirements (40 marks)

To capture requirements you will need to

1. Study the case study,
2. Research using the web,
3. Add the results of your research on the ResourcesForLearning/Research page in Wiki and make sure to follow the instructions on how to do this very carefully. Instructions and an illustration of how to this can be found on the ResourcesForLearning/Research page in Wiki.
4. Choose one of the following methods: interviewing, direct observation, brainstorming or another method of your choice.
5. Record this process using one or more of the following: video, podcast, webcam, module class discussion, collaborative document *or* another method of your choice.
6. Add the results of your recording of your chosen method on the ResourcesForLearning/Requirements page in Wiki and make sure to follow the instructions on how to do this very carefully. An example of using a podcast and a recording using a web cam as a device is provided on the ResourcesForLearning/Requirements page in Wiki.to help with this.
7. Complete the Requirements Document Template provided on the ResourcesForLearning/Templates page in Wiki.

Ensure that this section is clearly visible in Wiki

- a) Capture requirements following the steps above: You are required to identify user's needs for the "little shop of horrors child minding agency". Record your data using the requirements template provided in the learning resources area on Wiki.
- b) Make sure the method chosen i.e. interviewing, direct observation, or brainstorming has been recorded using the appropriate device; for example, audio or visual podcast, video or webcam recording, module class discussion, collaborative document in Wiki or another method/device of your choice. Show it to a set of potential users and get some informal feedback.[use another ISD2 student group NOT in your assessment group]. This process must be made available via a link at this location in Wiki: ResourcesForLearning/Requirements. You must also provide a link to this in your private group space in Wiki and ensure it is visible with text which clearly explains this for the tutor. Each group must ensure that their group number and the group number of the group evaluating their product is clearly visible on Wiki.
- c) Based on your user requirements, choose two different user profiles and produce one main scenario for each one, capturing how the user is expected to interact with the system. The process and the outcome must be clearly documented in your private group area in Wiki.

Task 3 (Group) - Develop Storyboard, and Detailed Design (20 marks)

Ensure that this section is clearly visible in Wiki in your private group area.

- a) Produce a storyboard based on requirements and user needs identified in 2 (a).
- b) Show it to a set of potential users [using the roles provided on the "Roles" handout role play within your student group in Wiki] and get some informal feedback.
- c) Sketch out the application's main screen (home page). Consider the screen layout, use of colour, navigation, audio, animation, etc. While doing this consider: Where am I? What's here? Where can I go? Write one or two sentences explaining each of your choices, how these choices will affect the users, in particular Diresh, and consider whether the choice is a usability consideration or a user experience consideration."

Task 4 (Group) Develop a current physical dataflow diagram (20 marks)

Ensure that this section is clearly visible in Wiki in your private group area.

- a) Draw a current physical data flow diagram using Britton and Doake notation (in the course text book) which clearly labels the input and output flows, and shows the system boundary.
- b) State any assumptions you have made, and document at least two questions that you have asked during your requirements capture (task 2 above).
- c) Using your own words in one sentence state how the Data flow diagram relates to requirements.

Task 5 (Individual) – A reflection on task 1 to 4 (15 marks)

Using your Blog on StudyNet, each individual group member is required to keep a week by week reflective log of the process undertaken to complete this assignment this is to help you reflect upon your experiences. This forms part of the final group report submission. You may use pictures, sound etc to describe your experiences. This Blog should not exceed 10 pages of A4, must NOT be made visible to the group before the submission date, this Blog will be accessible online by you and your tutor only and must include:

Evidence (a-s) using screen shots in Wiki and/or the other technologies provided/used. It may help to define categories in Blog under headings.

Write a paragraph describing the usefulness or otherwise of keeping this weekly Blog and of posting reactions to the week's use of Wiki, the alternative technologies, reflections on group assignment and group process.

You are also required to write at least a paragraph on how you met the group commitment outlined in task 1 of the assessment. It is important that you are clear about your commitment and show evidence of this commitment to your group and group work this may be through signed meeting attendance (see task 1).

B.ii Roles

Description of Roles: Developers

The following is an overview of the roles you will need to play when acting as Developers for the “Little Shop of Horrors” project. When playing the role of developer each member of your group must choose one of the following roles:

- Business Analyst
- Systems Analyst
- Project Manager
- HCI Specialist

Business Analyst

- Initial Stages of project.
- Specialist in business.
- Aware of technology used in business
- Knowledgeable about rivals and competitors.
- Aware of needs of the business
- Communicator
- Facilitator
- Helps to focus client on needs of business
- Helps users set realistic goals
- Liaises with Systems Analyst

Systems Analyst

- Specialist in Systems Analysis, Design
- An instigator of change
- Some implementation knowledge
- Specialist in tools and techniques for Analysis and Design
- Communicator
- Facilitator
- Liaises with Business Analyst

Project Manager

- Match skills to job
- Determine roles and responsibilities
- Put team together
- Team Leader
- Project Plan
- Check resources available
- Provide Clear and detailed briefs
- Highly organised
- Motivator
- Facilitator
- Communicator
- Delegates

HCI Specialist

- Graphic/Artistic Awareness
- Aware of Users and Needs
- Designer
- Creator
- Expert in Cognitive issues
- Perceptive elements of Interface
- Evaluation expert
- Communicator

Description of Roles: Clients/End User

The following is an overview of the roles you will need to play when acting as Clients/End users for the “Little Shop of Horrors” project. When playing the role of client/end user each member of your group must choose one of the following roles:

- Owner - Anita
- Managing Director - Diresh
- Secretary – Anne
- Accountant – Steve

Owner

Anita is married to managing director Diresh. She is very adaptable, flexible and always willing to change how the business currently operates if it means improving efficiency and productivity. However, Anita would like to retain many of the current working practices. She has the “why fix something if not broken” attitude. Anita has considerable experience using computers and is familiar with a number of software packages.

Managing Director

Diresh is married to Anita, supports the owner in making decisions. He likes how the business currently operates therefore, is not too keen on change. He is terrified of Computers and believes that a computer would bring chaos to the business and will not be cost effective. Anita tends to say that her husband “has a lock on his purse”.

Secretary

Anne the secretary has been with the business since its opening. Anne gets along very well with both Anita and Diresh and loves her job. She particularly likes the flexibility of the job, which enables her to do her typing from home. She has a passion for her typewriter, which has been part of her

life for some years now; in fact, she was top of her class at secretarial college thirty years ago.

Accountant

Steve has been with the business since its opening. He is a retired accountant who occasionally keeps the books for the business. He came highly recommended from a friend of the family. Essentially, he works for enjoyment. He likes to read the literature and is aware of the latest technology. In fact, he occasionally is known to use the Internet.

B.iii Case Study

Case Study used in Assignment

Background

When Anita Patel had her first two children Priti and Javik, she continued working and employed a childminder Mary O' Hara. After 6 months, Mary left and Rita Smith was employed. Over time, childminders came and went with distressing frequency (the reason given was Priti had a tendency to bite!). These childminders came from a childminding agency called "Happy". By the time, Anita's third child was on the way she decided that rather than paying her childminders salary, and finding the fees for yet another childminding agency, Anita would be better off staying at home and running her own childminding agency. She was sure she could do a better, more efficient job and her husband Diresh agreed –hence "Little Horrors Child Minding Agency" was born (called after Priti).

Currently Anita with Diresh as the managing director runs the business. From time to time, Anne does a little typing and Steve keeps the accounts.

Three years on, Anita has diversified. In addition to providing childminders, she also provides gardeners, housekeepers, chauffeurs, and stable staff. Anita

has also decided that she will make more money by restricting her business to handling temporary staff placements only.

Although the business currently does not use a Computer System. Anita has considerable experience using Computers and is familiar with a number of software packages. Her husband Diresh has no such experience; in fact, he is terrified of Computers!

Anita and Diresh would like a computer system to replace the current paper based system. They wish to computerise the registration side of their operation and in particular, to deal efficiently with telephone calls from potential clients. They would also very much like to have information relating to temporary staff and their availability at hand so they can deal with requests for help more efficiently.

How the business works

Anita advertises weekly in the local papers, and in more specialist publications such as 'The Lady' to ensure her 'pool' of available temporary staff is kept topped up. She also advertises her services this way. She stores the information about temporary staff in a card index file in name order within the section that relates to the particular service that they offer.

Prospective clients ring in to enquire for further details on the services available. They are sent an information pack, and a registration form. All clients have to register and pay a small fee, which enables them to use the agency for one year. Anita stores the client's name and address details, and the dates and amounts paid, on a Client Card.

Registered clients can request temporary help around the house. It is not unknown for some of Little Horrors richer clients to ask for a number of domestic staff to cover different requirements.

When a client rings in with a request, the type(s) of help required is/are agreed, together with the period required, and Anita confirms the hourly rate for each type of service. Anita draws up a contract to send to the client to confirm their verbal agreement and keeps a copy in her office for her records. She identifies relevant helpers from the card index and checks if they are available (by details on the card and by telephone). She allocates who is to fill each job and informs the client and the helper.

Each week these temporary helpers fill in an individual timesheet detailing the hours worked, and for whom. When timesheets arrive at the office, they are

put in the 'in-tray' until Anita has time to create the invoice. She produces one invoice each week for each contract covering all the relevant helpers (see copy invoice for representative sample of information sent). The copy invoice and the timesheet it is raised from are stored with the contract details. When the payment is made, Anita deducts her 15% and forwards the rest to the helper(s).

On a monthly basis Anita goes through her client file, identifies whose registration fee is out of date and sends them a request for a renewal of payment.

Case Study used in Assignment (continued)

Little Horrors Helper card index

There is one card for each helper. A typical card is shown below. The card is filed alphabetically within the skill type offered.

When business is slack, Anita goes through the cards, contacting any she has not spoken to within the last two months to check if they are still available, and archiving any who have found jobs elsewhere.

Anita	Young
Child Minder	
Tel: 01707 – 283000	
9 The Ridgeway	Last rang:
02/02/2001	
Hatfield	
AL10 9SG	

Temporary Assignments with Little Horrors

Sept 2000 – Jan 2001 Mrs Evans, contract no 1234/00

Feb 2001 – June 2001 Mrs Soames, contract no 0045/01

COPY INVOICE

Mrs J. Soames

Kings Cottages

Burghfiels Common

Bulls Green

AL3 2SG

Invoice no: 37001

Date: 8th February

2001

This invoice relates to contract 0045/01

Charges for services rendered from 08/02/01 – 15/02/01

Anita Young (nanny)	20 hours @ £ 4/hr	=	£ 80
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Dave Grange (chauffeur)	5 hours @ £ 6/hr	=	£ 30
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Total value			£ 110
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B.iv Conceptual Design: Researcher/Practitioner Notes

Community Development
more open, participatory style?
of working
Student need.
primary data perceptions of those
working / involved in community.
Needs resources.
Get students to do action plan
for improvements ^{with support} ^{skills of}
Assess needs - resources - members.
(balance) Other student contributions
What other resources would you
find useful?
A new way of looking @ how
students can support each other?

② Review -> resources i.e. tech,
materials adequate? + meet the
needs of community. vs need
of individual vs need
of community.
Define Community - ^{share common}
interest
Problem ^{Same group}
what about / i.e. student,
site? characteristics, age, etc
=> Community within community
for identifying similarities & differences
between constituent community
i.e. groups of students

(3) Collect, analyse + present info about community

RQ2 What are the needs of the learners community + how might these be addressed?

Result: fuller, more comprehensive + more accurate description of community, + hence an informed basis in which to make decisions about provision + the way forward.

Empower students through skills development, confidence awareness of ^{and ownership} learner community.

Activated set to aid community development.

(4) ^{summary} Community sense of ownership of process + outcomes through c/w, design own learning environment, add to resources, Action Plan, peer review, Generate ideas, discussions related to activities - staff roles

RQ3

Description of what are the needs of the learner that is defined or defines itself as a learner community, ^{what are the} ^{needs of} ^{the learners} ^{community} ^{to support} ^{learning with} ^{community}

My community of interest is:

Student aged 18-25, L2 KST degree students, shared problem, shared working environment, sense of belonging.

Impact in community

Programme level: other tutors, programme of study, Student groups, Student cohort.

PAGES: Wiki, Blog, StudyNet, G.A. Area, DF, Blog.

Group Areas: - PAs, - PAs, - PAs, - PAs

Empowering the Community
from passive recipient to active engagement

- motivation to come together
- Identify its requirements
- Plan its actions
- take part in developing environment, resources

Enthusiasm/Motivation Check

- 1) purpose of community (make sure clarity of purpose)
 - 2) Start small, get going quickly
 - 3) make it fun.
 - 4) students involved at all stages
- + activities stimulate + engage
sustain commitment + enthusiasm.

Characteristics of the population

How many? Age? Sex? Ethnic group? previous education? previous group work? previous technology use?

⇒ Quantitative Data - generalise about the whole or part of community.

Qualitative Data

Attitude, belief, feelings, impressions, opinions. - identify issues
- insights, ideas

which account for the part of the population
- how the com. dev + changed
Collect info on characteristics of com.

Data: Characteristics of:

Env: private, public space

Resources: materials, students, tutors, tech,

Spaces: what was useful, not? / how used?

learn online? Support learning?
learn anything from peers?
prefer f-2-f?
Complement f-2-f?

Population: Student-tracts, Staff, other?
Social, Educational, Access to
web/tech/elect. stores? / tutor?
materials?
Forms of communication

What about...
what about...
what about...
what about...

+
range of...
Access...
+
Access...

Appendix C

Publications related to the thesis

Doolan, M. A. Thornton, H. A. & Hilliard, A. (2006) 'Collaborative Learning: Using technology for fostering those valued practices inherent in constructive environments in traditional education'. *Journal for the Enhancement of Learning and Teaching*. 3 (2) pp.7-17

C.i Collaborative Learning: Using technology for fostering those valued practices inherent in constructive environments in education

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Summary

This paper presents a rationale for learners to learn through working collaboratively. An overview of the use of a number of different collaborative technologies to support pedagogy in a Blended Learning environment is reported. These technologies are then illustrated using three examples.

The first is a completed study, which investigated the use of StudyNet, the University of Hertfordshire's managed learning environment (MLE), to facilitate collaborative learning with third year students studying on an undergraduate programme in Physiotherapy. The second is a work in progress in Radiography, which is investigating students' use of StudyNet to support assignments on a third year undergraduate programme. The third is a work in progress in Computer Science, with second year students exploring the use of alternative collaborative technologies, including Blogs, Discussion Forums and Wiki, to support online collaborative working and collaborative learning.

Collaborative learning: Why do we want students to learn through working collaboratively?

Collaborative working is perceived as a means of working more creatively, a 'two heads are better than one' approach, and a means to improving learning (Thorley & Gregory, 1994; Edwards & Clear, 2001). Students working together tend to do 'better' than those working in competitive and individualistic settings. 'Better' meaning deeper learning, which emerges as

students become active participants in the group's learning (Tribe, 1994). Students working collaboratively tend to produce better results (Gupta, 2004). Collaborative learning has relevance for industry, in that employers want graduates with transferable skills or generic competences (Harvey & Mason, 1996; Dearing, 1997; Pew Commission, 1998; Doolan & Barker, 2004) and in academia, with increases in student-staff ratios there is an increasing focus on creating a student-centred learning approach and the student as a self-directed learner. At times, the lecturer perceives collaborative working as a way of dealing with large student numbers and tight time constraints (Edwards & Clear, 2001; Pilkington *et al*, 2000; Doolan & Barker, 2003). This is all within a context where the UK government wishes to widen participation, increase student numbers and produce lifelong learners as set out in the White Paper on the future of Higher Education (Dearing, 1997).

Technology can be used as a strategic resource in supporting teaching and learning. The current infrastructure and investment that is available means that there are opportunities for technology to be used in collaborative learning. This may complement traditional practices and provide open and distance learning, while at the same time fostering those valued practices inherent in constructive environments, perceived as being important practice in traditional education.

Why use a blended learning environment for collaborative learning?

There has been considerable pedagogic research into collaborative learning and it has been shown to contribute to the graduate skills of 'teamwork, communication, lifelong learning and problem-solving' (Gupta, 2004, pp.63). However, there has been limited research in using this approach in a Blended Learning environment (Baskin *et al*, 2005). The importance of processes and clear guidance to facilitate students to engage in collaborative learning activities has been widely reported (Hartley, 1999; Maor, 2003; Doolan & Barker, 2004). This includes processes such as:

creating templates

establishing deadlines

encouraging the group to adopt an agenda.

Hiltz & Turoff (1978) reported that options not available during face-to-face meetings are provided by systems such as anonymity of group members and increased access to possibly widespread information. Students can work at times and places convenient to themselves, thus giving them flexibility (Alltree & Thornton, 2004). Working collaboratively online provides the opportunity for scaffolding, particularly in the form of learner-to-learner support, enabling students to input documents, share ideas and provide feedback to each other on the input. This is one way of supporting student learning that is both cost-effective and an efficient way of managing learning

online (Lockwood & Gooley, 2001). Students have been shown to value peer-produced resources in their learning (Doolan & Barker, 2004; Alltree & Thornton, 2004). An important motivational factor for the learner in using these systems is the nature of the task in which the learners are engaged. Within the task, each member of the group needs a structured job to do (Crook, 2003). Online group work seems to work best when the participants themselves are encouraged to take individual ownership of the roles required and of their role in the discussion (Pilkington, 2000). The key issue is that learning processes might become visible, and thus enhance the quality of the feedback provided by tutors, in addition to the feedback learners receive from one another (Crook, 2003). A further advantage of working collaboratively online is that the tutor can view how well the group is working together and can monitor the pattern of performance within the group. It is also a very useful tool for monitoring the level of student engagement amongst their peers. This helps in further understanding students' study patterns; this will be discussed below (see Figure 2 in Example 3). The following table provides a summary of current online technologies to support collaborative learning:

[Place table 1 here – Supplied separately]

Table 1: Technologies for collaborative learning

Pedagogy for collaborative learning in a blended learning environment:

The role of the learner

In collaborative learning the emphasis is on the students and the learning environment. Learning is a social activity where peers play an important role in encouraging learning. Vygotsky (1978) argues that students and tutors take on specific roles in this learning environment. Students play an active part and assume responsibility for their own learning, solving problems while working together with their peers. Working collaboratively online supports this, as it provides the environment where students actively engage in the learning activity whilst providing peer-to-peer support and feedback to members of the group.

Learning in a blended environment requires the student to take further responsibility for managing their own time in order to become autonomous learners, whilst utilising online resources effectively (Allan, 2004; Sweeney *et al*, 2004). This is exemplified in example 1. In order to participate effectively, students do need sufficient IT skills to overcome the social and psychological barriers (Cramphorn, 2004). When students do not collaborate effectively, the social and cognitive advantages of group learning are lost (Soller, 2001), see example 2. It has been recognised that collaborative learning does not suit all learners (Laurillard, 2002) and online collaboration may, in itself, cause stress for collaborators (Allan & Lawless, 2003), see example 2. Students may find publicly exposing their views difficult, as in for example discussion

forums. This in part may be overcome by allowing anonymous posting, see example 1.

The role of the lecturer

Sfard (1998) indicated a change in the role of the lecturer/instructor from one of delivering, conveying and clarifying, to one of expert participant. This role should not be underestimated and it is well documented that it is a critical factor, especially where course design emphasises peer learning (Kear, 2004; Sweeney *et al*, 2004). Duchastel (1997) reports that the lecturer/instructor should:

Specify goals to pursue instead of content to learn.

Accept a diversity of outcomes instead of demanding common results.

Request the production rather than the communication of knowledge.

Evaluate at the task rather than at the knowledge level.

Build learning teams instead of assigning activities that only have meaning to the individual.

Promote global learning communities instead of remaining localized.

When technology is used in teaching and learning it has been well documented that the cognitive load, as well as the time burden, on the lecturer/instructor can become very high (Collis & Moonen, 2001; Fitzgibbon & Jones, 2004). In example 1, the lecturer addressed this by reducing the

teaching contact time, enabling the lecturer time to support collaborative working online. In addition, by empowering the students to view their peers as a resource for learning, dependence on the lecturer is reduced.

Three examples of using technology collaboratively to complement traditional practices

The following examples refer to StudyNet, which is the University of Hertfordshire's managed learning environment (MLE). Example 3 uses other technologies such as Blogs (available within StudyNet) and Wikis.

Example 1

The first example is a completed study that investigated the use of StudyNet to facilitate collaborative learning with 80 third year students studying on an undergraduate programme in Physiotherapy.

Course delivery

Topics for each week were focused around a specialist patient group in a modified Problem Based Learning format (Schwartz *et al*, 2001). Class contact was reduced by 26 hours to enable students to work collaboratively in preparation for seminars. Lectures were delivered by practitioners and these were followed by seminars, where students gave presentations on the

weekly topics. Students were placed in teams based on their Belbin roles (Belbin, 2003), were taught teamwork theory and participated in a tutorial in which the teams set the ground rules for working. This induction process was to promote effective teamwork and skill development, skills which are highly valued in the NHS.

Using a blended approach in the delivery

The functions that were used via StudyNet included news, module information and teaching resources. Additionally, the discussion forums were seeded, and resources and web links were posted. Students provided a weekly electronic file to go onto StudyNet, which was posted in teaching resources by the tutor. The cohort was divided into groups, then teams, so for each topic there were several teams doing the same topic and students could see several interpretations. This integration has been formally evaluated over several years.

Evaluation of delivery method

From one questionnaire (Alltree & Thornton, 2004) 98% of students rated the use of StudyNet as 'Very useful' and feedback comments included: "*The best thing since sliced bread*", "*Excellent way of communicating, fair to all*". Subsequent development has resulted in high levels of engagement with StudyNet. Analysis of student feedback suggested there were three main

themes showing why students viewed the peer materials and the discussion site:

To voice concerns/worries, request clarification

Keep for future reference/hard copy/print off

Broaden knowledge/other points of view

Students developed their graduate skills through preparation for the seminars, including self-management, communication and interpersonal skills, searching, presentation and intellectual skills to contrast the evidence with practice. The students recognised the value of the seminars as evidenced in their comments: *“helped to generate our own views and arguments in a very productive way”*, *“Difficult subjects but seminars compelled us to take a closer look – Good Tactic!”*, *“Much improved confidence, great teamwork, a good way of learning”*.

Using a blended approach in the assessment

Three different pieces of assessment were used:

Coursework – a discussion of the issues in an article with a choice of 6 articles, which were accessed electronically.

Exam – using ‘take away’ topics (Freeman & Lewis, 1998), which reflected the learning process they had been undertaking and with a choice of questions.

Presentation – allowing them to choose the topic and utilise the skills they had learnt in the seminars.

The students were also encouraged to discuss coursework and they used the discussion facility to organise face-to-face meetings. By using the discussion facility, all students had access to these meetings and it encouraged the sharing of information not only in their normal friendship groups but also across the cohort.

Evaluation of assessment method

In one year there were 255 postings on the discussion site. Some students highly valued the anonymous thread, “I felt more confident to post anonymous questions”, “I like the anonymous thread as students can ask more questions without feeling silly”. Of the 54 responses on the anonymous thread, only 15 had been made anonymously. On all the rest, the students had posted their names. Of the 71 discussion threads, only 20 were not directly related to assessment. When actual postings are considered, of the 255 postings only 23 were not related to assessment. This illustrates the importance of using a blended approach to the assessment as well as the delivery.

This example highlights the use of group work to facilitate skill development, especially team-working skills that are required for the effective treatment of patients. It also shows the importance of ‘carrots’ to engage students. In this case, the use of discussion sites to support assessment, and the opportunity

for students to see their peers' work, make comparisons and challenge their own viewpoint.

Example 2

The second example presented is a work in progress in Diagnostic Radiography which seeks to investigate students' use of StudyNet to support assessment on a Level 3 undergraduate module. The module contains common core material, which students then investigate from the viewpoint of their chosen imaging modality. This module uses a spiral syllabus design as described by Pincas (2002), see figure 1 below:

[Place figure 1 here – Supplied separately]

Figure1: Spiral syllabus design (Pincas, 2002)

Assessment for this module requires students to work collaboratively while undertaking three pieces of assessment using three different methods of participation. This assessment drives the students to develop team-working skills essential for working within the NHS.

Using a blended approach to the assessment

The first piece of assessment involves students exploring applications of a chosen imaging modality relating to the head and neck region in electronic

journals as provided within the learning resources section on StudyNet. Firstly, students individually have to upload a link to an electronic article and a 200 word summary of its contents by a preset deadline date. Students must then write an individual assignment based on three related articles uploaded to different imaging modality group areas.

The second piece of assessment involves students working in groups of their own choosing and submitting a group written assignment based upon a choice of three topics exploring differences in general radiography and specialist imaging areas.

For the third piece of assessment, students are required to work in groups that are not of their own choosing. They are assigned to groups and asked to critique a given website. Each group member is given a specific task, and a group written assignment must be submitted. This type of group work is commonly called the 'jigsaw method' (Schweizer *et al*, 2003).

Evaluation of assessment method

Following the submission of the three pieces of assessment, students are given a brief questionnaire asking them to indicate the number of times they accessed StudyNet in order to carry out each task, and their opinion as to whether the type of assessment encouraged them to learn independently and

effectively. They are also asked to indicate strengths and weaknesses in each type of assessment. Following the submission of the three pieces of assessment, students rank the three pieces of assessment in order of preference. The data generated is analysed and used to inform the future use of online collaborative working within the programme.

Problems did not occur in the first piece of assessment, which was submitted individually. For the second assessment, however, there was a minor incident of one of the groups completely breaking down in their ability to work together. With hindsight, greater preparation of the students to undertake group work may have been beneficial. The third piece of assessment is currently awaiting submission.

Example 3

The third example presented is a work in progress in the School of Computer Science exploring the use of alternative collaborative technologies. The technologies are currently being used to support in-module assessments with 90 second year students studying an Information Systems Development module. These technologies lend themselves well as tools for collaboration and communication for developing communities for learning. This study seeks to explore their potential for supporting online collaborative working and collaborative learning. Furthermore, it seeks to understand how pedagogical change can bring about improvements of learning.

Using a blended approach to collaborative working

As part of the assessment, students are required to undertake tasks working collaboratively in groups of six. These are allocated by the tutor from across the cohort.

Groups are provided with their own private collaborative space to engage with their peers including Wiki technology and the group area on StudyNet. Features enabled for the group on StudyNet include Blog, Project Planner and the Discussion Forum. These are actively used by students alongside their group area on the Wiki. The general class discussion on StudyNet is also utilised. Students are actively engaged with the technologies alongside traditional face-to-face meetings and class contact. Figure 2 illustrates this active engagement with Wiki over a four-week period.

[Place figure 2 here – Supplied separately]

Figure 2: Student engagement with Wiki over a four-week period.

The Wiki provides an indication of the students' study pattern and level of engagement with the technology over the duration of their first in-module assignment. The majority of engagement took place on Thursday when the students were timetabled for this module. It is evident students were working

constantly throughout the week, but with higher levels of activity on Sunday than Saturday. As might be expected there is a natural progression in learner activity (3,539 page loads) on the Thursday prior to the Tuesday assessment submission day. As mentioned above, an important objective of this study is to explore the potential of the technology for supporting collaborative working and learning. This pattern of usage indicates that the technology is supporting these learners whilst undertaking their group assessments. As this is a work in progress there is further analysis that needs to be carried out.

Evaluation

A range of qualitative and quantitative evaluation methods are being employed in the study, including students' reflective Blogs. The intention is to examine and present students' views about the extent to which the various technologies facilitated collaborative working and learning in a Blended Learning environment. Student contributions to the technology will be analysed in order to explore how the students worked and learned collaboratively using the technology and how pedagogical change can bring about improvements in learning, using online communities for learning regardless of the technology.

Conclusion

This paper has reviewed the use of collaborative learning in a Blended Learning environment, using a number of different technologies. For this to be successful, it needs careful module design to use the technologies in an effective way, and it requires changes in the roles of learners and lecturers. The students need to take responsibility for their learning, and organise their time effectively to use both the face-to-face teaching sessions and the availability of online resources. The three case examples illustrate different ways of integrating technology to support collaborative working and learning. Lecturers need to become familiar with the technology and then seek to integrate it into their courses as an integral part of delivery.

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Martina A. Doolan graduated from the University of Hertfordshire in 1996 and joined the University as a member of the academic staff in the School of Computer Science. Martina has been active in the area of Teaching and Learning since joining UH with a particular interest in exploring/exploiting alternative technologies to support learning. Martina is currently working on developing online collaborative spaces and building learning communities. Martina gained the Vice-Chancellor's Award for excellence in Teaching and Learning 2004, is a principal lecturer in Computer Science and is a BLU teacher.

Alan Hilliard qualified in 1988 as a Diagnostic Radiographer and worked within the NHS until 2001. Since moving into education in 2001, he has developed his interests in motivating students to engage in active learning. From the introduction of StudyNet he has worked to investigate methods of integrating it into teaching and learning, and to explore new ways of collaborative learning, to create a blended learning environment. Alan was made a University Teaching Fellow in November 2005 and is currently

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Heather Thornton qualified in 1986 as a physiotherapist and then worked in the NHS until 1999. She specialised in the neurosciences, and health service management. Since moving into education in 2000 she has been interested in how to encourage students to take an active part in learning and the use of group work. Heather became a University Teaching Fellow in November 2005 and is a BLU teacher.

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C.ii Effective Strategies for Building an Online learning Community Using Wiki Technology

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Abstract

This paper aims to share practitioner experiences of using Wiki technology to develop and build an online community to support ninety-six second year undergraduate students undertaking assignments on a computing programme in Higher Education over a one-year period.

A Wiki is an online collaborative authoring tool providing learners with an opportunity to create their own learning environment whilst providing a greater range of opportunities for students to interact with each other outside the classroom boundary. Interaction between learners is a vital ingredient in social learning where the emphasis is on collaboration, negotiation, debate and peer review, and is central to the constructivist learning approach. Therefore, setting up an online community takes time and effort, requiring a level of technological competence, an understanding of learning theory and learner needs. This raises a number of pedagogic challenges and opportunities for academics.

Through a practical example of implementing a Wiki, this paper provides guidance for academics rising to these challenges and opportunities. Student motivation, engagement and fostering ownership for a student-directed learning community is a critical success factor to consider in the design of the environment. In this example, this is evident from the 35,599 hits to Wiki over a four week period and 66,122 hits to the Wiki for the duration of the module.

The approach and methodology adopted use both qualitative and quantitative data and considers a practitioner's first-hand experiences, observations and interpretations of student engagement in Wiki enabled student-student community learning.

Key issues to consider when designing this type of learning experience are the role of the tutor; in this example front-loaded then stepping-back, the type of 'blend', such as the mix of online and face-to-face, assessment mechanisms and the opportunity to enable students to develop in other key areas, for example transferable skills and employability. All of these areas, staff development, skills, personalised student learning, 'embedding' and exploiting the pedagogic potential of new technologies are core aims for institutions (DfES 2005).

Keywords: Online, Community, Wiki, Collaborative, Social learning, Constructivist, Personalised learning

Introduction

The Higher Education Funding Council (HEFCE) released its 10 year e-learning strategy in March 2005. The overall aim is to help HE institutions 'embed' e-learning into all aspects of teaching and learning: 'Our goal is to help the sector use new technology as effectively as they can, so that it becomes a 'normal' or embedded part of their activities.'

The planned implementation of the Department for Education and Skills (DfES) 2005 e-Strategy is in its first phase, with a focus on personalised student learning through the 'harnessing' of new technologies. Becta is charged with implementing the DfES strategy:

'An impact that will stimulate the imagination and creativity of learners, that will engage, enthuse and motivate, engender collaboration and promote self-directed personalised approaches to learning. We are also seeking to apply technologies that will transform the way in which our educational institutions operate and are managed and the way they connect with and enable interaction and involvement of learners. (Becta, Aug 2006)

Therefore, there are many issues for HE institutions to address as they move towards these goals, for example internal structures and processes and staff development. As part of HEFCE's implementation process for the e-learning

strategy and led by the Higher Education Academy, all UK HE institutions in November 2005 were invited to participate in a self-assessed internal audit, called a 'Benchmarking Exercise'. Feedback from the eleven pilot institutions identifies key priority areas to address: 'There is an increasing focus across the sector on the 'soft' issues, for example staff attitude's and skills, and a declining emphasis on VLE technology.' (Benchmarking Pilot Evaluation Report, Aug 2006).

It is becoming increasingly important to address the people issues and specifically to support academic staff in developing appropriate skills and expertise. This paper will focus on the academic, their role as tutor and how to create an online learning environment using a Wiki, to encourage collaborative task driven student-student interactions.

There are four key aspects to recognise throughout this paper and in relation to the approach adopted. First, concerns the role of the tutor and a need to identify how students will be supported online (JISC 2006). In this study, and using a constructivist approach to teaching, the emphasis is on a self-directed approach with the learner building knowledge through interactions with others and the environment (Vygotsky 1978). Learning involves participation or engagement with others in a community of practice (Wenger, 1999) and through relationships with people (Lave and Wenger 1991). Accordingly, the tutor approach adopted was front loaded in terms of tutor

time, by setting the learning agenda providing detailed instructions, learning activities, templates, resources and materials for learning and when presented to students the tutor would then step back. This is not the approach normally adopted whereby the tutor acts as 'facilitator or e-moderator' (Salmon, 2002). This stepping-back approach enabled students to engage with each other without tutor intervention, online facilitation, guidance or support. This might seem risky, but this is kept to a minimum by spending time up-front and a careful design of the student learning experience. Key to this approach is the need to communicate clear expectations to the students from the outset and to ensure that these are fully understood (Chickering and Gamson, 1987). In this example, the result is a high level of student motivation and engagement.

Secondly, the tutor needs to decide on the 'mix' or 'blend of face-to-face and online activities. A commonplace approach is to use compulsory face-to-face teaching with online support materials provided through an institutional VLE. However, the most effective blend is by maximising the pedagogic opportunities afforded by each methodology, often requiring module redesign, including a review of assessment practices. This latter approach requires commitment and an up-front investment in tutor time, but can result in a much more engaging and richer student learning experience (Sharpe and Benfield, 2006). The approach presented in this paper embraces the latter concept.

Thirdly, assessment practices need rethinking to ensure they reflect and support the approach adopted (Nicoll, 2004); for example, online learning

activities completed individually and in groups should become an integral part of the overall module assessment. This will motivate students, encourage engagement, foster ownership and collaboration, all helping in the formation and development of a learning community. In this paper, students collaborated in groups and worked on specific learning activities, which involved group and individual assessment.

Fourthly, the approach adopted in this paper encourages the development of employability and transferable skills: collaborative learning lends itself to a problem-based learning approach (Zumbach and Reimann 1999, Doolan et al 2006) and helps students to develop appropriate skills. The students referred to in this paper are future IT professionals who need to develop team working and problem solving skills. This is particularly relevant for the cohort of students referred to in this paper, since there is no work placement element to their module.

The Module and Context

Ninety-six second year undergraduate students studying on a combined modular degree in Information Systems undertook this module. The module is built around information systems case studies, providing an insight into realistic company environments. The overall aim is for students at all stages to develop their skills in building computer-based, user-friendly information systems. The development of problem-solving skills was encouraged, replacing the current paper-based system with a computer-based system.

This 'real-world' approach included a problem based learning assessment methodology. Students were divided into groups, which were randomly selected from a class list by the tutor to ensure a cross section of learning ability and learning style. Students were required to carry out a thorough analyses and design of a computer system using the Wiki learning environment, to complete individual and group work activities according to the needs of the community. The overall learning objective is for students to apply the principles and techniques of system development in a team environment, thus fostering and developing collaborative working skills. The students are also expected to use appropriate engineering practices to make informed decisions about best approaches to an information system development. This requires students to move from problem identification through to implementation and evaluation processes, requiring decisions to pursue chosen approaches within the context of a collaborative working environment.

Learning Activities: the face-to-face and online blend

Active student engagement requires the chosen activities to be shared equally within and across the group, with an emphasis on learning by doing (Kolb 1984), and an emphasis on understanding and a deep approach to learning (Biggs 2003). Moreover, the activities in this study were set to enhance information sharing within groups and across groups, personalised

learning and autonomy (DfES 2005), encouraging learners to create their own learning environment, take control and to feel ownership for their own learning. Therefore, the assessment activities were chosen specifically to be shared and jointly owned within each group. This is an important motivational factor, with the aim of encouraging collaboration between learners to build a learning community. To create a shared responsibility for group learning and to foster individual responsibility, the problem presented needs to involve each learner with a specific and structured job to complete (Crook 2003). Students were provided with all of the relevant templates required to undertake the activities for the assessed learning activities and all associated activities were based on the case study. By completing the learning activities, this enabled students to complete the assessed report for the module and the Wiki provided an environment to complete the learning activities. The assessed report consisted of solutions to five sets of activities and included: Eliciting and Documenting Requirements and Group Commitment, Support for Project Stakeholders, Evaluation, Reflective Journal and Peer Review.

The face-to-face blend with online learning was carefully designed into the module and maximised the learning opportunities provided by each approach (Doolan and Barker 2005). To ensure students were adequately briefed and understood the requirements of the learning activities, a lecture provided the most appropriate method for introducing the online Wiki environment, through a live demonstration. A tutorial prepared students for the online group work

learning activities, taking students from a familiar face-to-face tutorial situation and leading them into an online collaborative environment through a simulated interactive exercise. Both the importance of team working and need to see this as an important life skill were emphasised; the face-to-face sessions were key factors in fostering student engagement and to prepare them for the online activities. This was achieved by providing a short report from industry outlining skills shortages faced by employers, helping learners to make the connection between this and the syllabus, and to emphasise the importance of teamworking, collaboration and the development of problem solving skills.

The online experience complemented and took forward the initial face-to-face lecture/tutorial approach by providing an environment for students to build a task driven, individual and group owned learning community. This required commitment from each group member to seed the community and to take ownership of the learning. To provide an initial context for the online process, students were required to distribute contact details and confirmation of their membership to the rest of the group, a photo of an animal, object or movie star to represent the group member, three sentences about themselves, an understanding of the ground rules and a brief project plan. Therefore, the design of the learning experience required careful planning and up-front commitment and investment from the tutor. Students who came late into the group or had difficulties were supported by other group members, and no tutor intervention was required. This takes the role of the tutor beyond that of

a facilitator or e-moderator (Salmon 2002), as is often the learning context created with group discussions delivered through an institutional VLE. Wiki technology allows the tutor to adopt a different role, exploring new approaches to support personalised student learning.

Methodology

The methodology of collecting data included both qualitative and quantitative methods. The sample of ninety-six students which comprised of sixteen groups of six were requested to complete the reflective group Blog (an online logbook), forming part of their group report and submitted by the student for assessment. The logbook responses submitted in this way were coded and analysed for responses based on specific questions, which were then posted on the Blog by the tutor to illicit discursive answers and feedback related to student experiences. Quantitative data was derived from these coded responses. In addition, a statistical counter was used as a measure to identify Wiki usage by students and this identified the total number of 'hits' to the Wiki made by individual students.

Results

Quantitative data

Figure 1 (below) details the extent of student engagement with the Wiki, as illustrated by the daily page loads (or 'hits'): 35,599 hits for a student cohort

of 96 over a four week period. Students were only required to use the Wiki over the four week period, but their engagement extended throughout the module and resulted in 66,122 'hits' over two semesters. This provides an indication of the students' study pattern and level of engagement with the Wiki over the duration of their first in-module assignment. The spread of activity over this four week period identified in Figure 1 is fairly even, although most activity occurs towards the end of the week. The majority of engagement took place on Thursday when the students were timetabled for this module. It is evident students were working constantly throughout the week, but with higher levels of activity on Sunday than Saturday. While specific conclusions about the depth of engagement cannot be made from this data, it is apparent that students were sufficiently motivated enough to engage with the learning environment and beyond the required four week period, thus supporting the need for a high level of upfront investment from the tutor in terms of carefully designing the learning experience and associated learning activities.

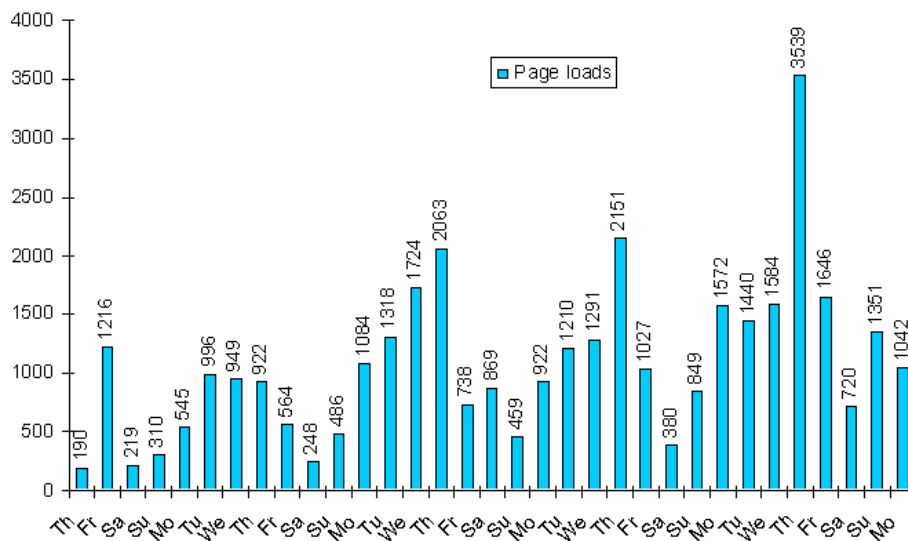


Figure 1: Number of student page loads (hits) over the four week period

Qualitative data

Group feedback was collected through specific questions via a reflective Blog enabling discursive answers and reflections. This provided both quantitative and qualitative data. Questions were collated and grouped around how the technology supported the learning process in relation to two specific aspects; support for collaborative ‘people’ issues and support for completion of the various learning activities and assessment.

Table 1 provides examples of student feedback in relation to the ‘people’ aspects (note: the group number is specified alongside each response).

Table 1 – How did the technology support group assessment – PEOPLE

<p>“the ability to review who has written what and who has changed” g.1</p>
<p>”quickest way each member could express their ideas” g2.</p>
<p>“we used Wiki to post up the questions we were stuck on” g2.</p>
<p>“ensure that participation in the project was free from intimidation” g3.</p>
<p>“gave group members an added sense of confidence and encouraged them to further participate without worrying about making mistakes” g3</p>
<p>“able to function as a team” g10</p>
<p>“only our group can put all our ideas up” g12</p>
<p>“ask members for their opinions” g13.</p>
<p>“put and share useful ideas, resources, use it to chat to members, solve problems”.</p>

Table 2 provides examples of student feedback in relation to the learning activities and assessment.

Table 2 – How did the technology support group assessment – LEARNING ACTIVITIES

“the most helpful part of Wiki is that someone can work on any task at any time” <i>g2</i> ”
“to help keep up-to-date with the progress of the project” <i>g3</i>
“great area to support our assignment” <i>g4</i>
“allows user to attach documents, presentations, images, journals and web links” <i>g7</i>
“add more detail on the learning activities” <i>g13</i>
“can post attachments of their own work” <i>g15</i>
” hyperlinks and simple text for creating new pages and cross links between pages” <i>g16</i>
“keeps track of changes” <i>g13</i>
“has proven instrumental to the completion of the module work” <i>g11</i>

Analysis

An analysis of the above results is presented in Figures 2 and 3, collating the qualitative feedback and presenting this in terms of quantitative categories. Figure 2 divides the responses from each student group in relation to how they felt the technology, processes and learning experience supported either a 'Task' or 'People Oriented' approach. Each group answered a range of questions and their responses are grouped accordingly. Note that the number of 'People' related answers totals 183, 'Task' related answers much lower at 82 and students identify Wiki technology as supporting the social interaction aspects of this learning environment, rather than the ability to complete the assessed learning activities.

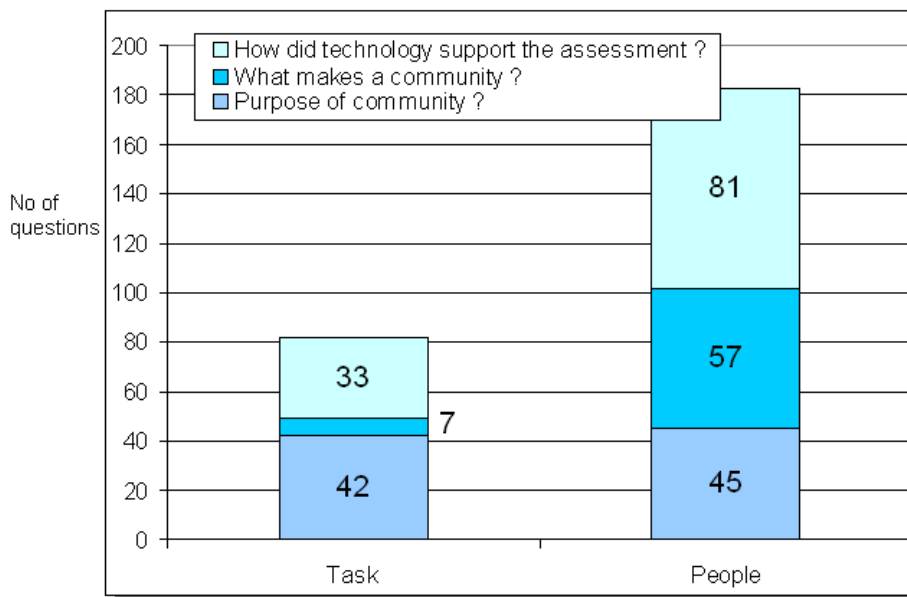


Figure 2: Student feedback on emphasis, i.e. Task or People

Figure 3 identifies individual group responses. Most groups felt that the assessment was fairly balanced between a 'People Oriented' and 'Task' driven approach, although several groups felt that there was no 'Task' emphasis to the assessment and the focus was totally on the 'People' element and therefore socialisation/collaborative aspects.

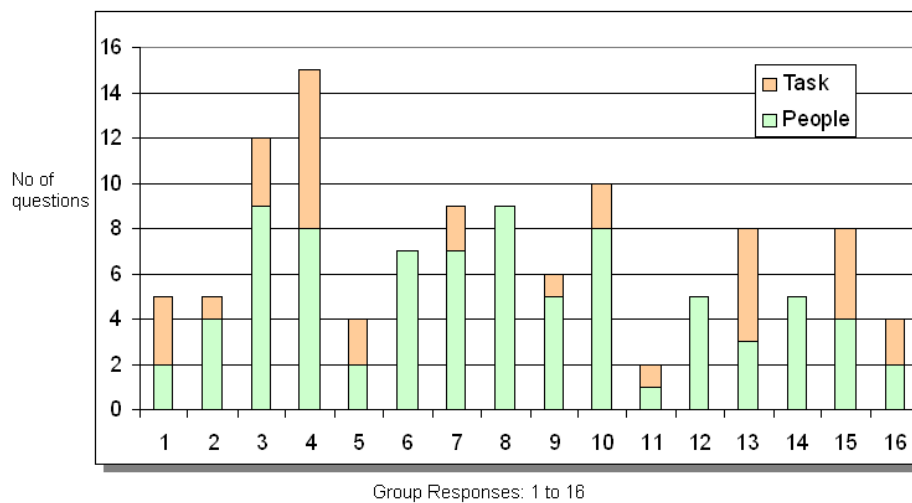


Figure 3: How did the technology support group assessment?

It is apparent from the above analysis that students valued the experience of using Wiki technology to support group learning activities and to foster a learning community. Both aspects are important when considering the design and implementation of a blended face-to-face and online learning experience. Students need to feel ownership for, and engagement with, their learning community and to see the relevance of completing online learning activities through tasks which build towards the module assessment requirements.

Discussion

This study is ongoing and the data presented in this paper is a snapshot of student feedback responses as a means for highlighting the importance of the tutor's role. In the example presented in this paper, key aspects to consider are; the careful design and implementation of the Wiki; to ensure students are adequately prepared for the online experience through face-to-face introductory sessions, a lecture and tutorial; and to ensure that students fully understand what is expected of them. It is also important for the tutor to clarify to students from the outset exactly what the tutor role will be in supporting them online; for example, if they are to act as facilitator or to leave the students to interact with each other. In the example presented in this paper, the tutor's role is to step back and allow student-student interaction. This resulted in the building of a learning community, fostering ownership, social interaction and a task driven focus.

Table 3 below suggests strategies for the tutor to address when introducing the use of Wiki technology with students, and identifies what this means in practice. These are very broad areas, but provide a context to consider both in the design and implementation process.

Table 3: Strategies for the tutor to consider

Areas to Address	In Practice
Approach Taken	Relationship with students and teaching philosophy
Establishing the culture Preparing students...	Setting and communicating clear directions / expectations
Learning Activities / Learning Tasks	Technology for learning
Supporting social presence	Nurturing student relationships
Student and teacher	Evaluation

On reflection, and for future work, there is a need to test this approach with other groups of students, and possibly for the tutor to adopt different roles, for example, to determine how this affects the student learning experience. There is also the issue of experimenting with the blend between face-to-face and online learning and how students respond to different mixes and emphases.

Conclusion

This paper has emphasised the need to consider the role of the tutor in designing and implementing an online learning community of undergraduate computing students through the use of Wiki technology. The role of the tutor is key in ensuring student ownership, engagement and to foster a learning community. Online activities should be considered in terms of the overall student learning experience and blend, combining face-to-face sessions with online learning to maximise on the pedagogic opportunities afforded by both approaches.

Table 4 below summarises the key issues arising from this specific experience of introducing Wiki technology to computer studies students. Although these specifically relate to the context outlined in this paper, many of the issues will apply equally to other disciplines.

Table 4: Summary of key issues for using Wiki technology with students

Importance of developing a strategy and communicating this to students
Students should be perceived as a community with a focus on both PEOPLE and the LEARNING ACTIVITIES set
The approach should be people oriented, providing the

opportunity to interact with others through peer to peer support for learning.

Students value the opportunity to manage their own learning and learning environment citing usefulness of editing, inputting and deleting information collaboratively, ease of use, creating hyperlinks to pages and new pages with cross linking. This was particularly evident in the students whose rationale for community was task orientated.

Students felt SAFE and SHELTERED, reporting that participation in the project was free from intimidation with an added sense of confidence and felt encouraged by their group members to participate. They were not overly concerned about making mistakes and indeed reported they felt that other group members would be willing to correct their mistakes.

Educators/tutors can influence the way a learning community develops and empower students to take ownership of their own learning.

Students are indeed a valuable resource: they are PEOPLE and do amazing things!

Wikis offer a major opportunity to personalise the student learning experience in a system of mass Higher Education. This is one of the key challenges we face (DfES 2005) and technologies such as Wikis not only provide new learning opportunities, they are relatively easy to set up and use.

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C.iii Collaborative Working: Wiki and the Creation of a Sense of Community

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Abstract This paper reports on the effectiveness of Wiki technology for creating a sense of community amongst 96 second year computing undergraduates engaged in group based assessment activities. This paper reports on the student experience, their attitudes and feedback relating to the use of a Wiki over a one year period at the University of Hertfordshire, through the use of pre and post test questionnaires. In addition to the questionnaires, student reflections were captured using a Blog, with entries about their understanding of the purpose of the community, rationale, and how the Wiki influenced and supported their undertaking of the group based assessment activities in a social constructivist blended learning environment.

Results from the pre and post test questionnaires shows a significant difference $t(64) = 2.527$; $p < 0.05$ in learner confidence in using the technology to support group work, $t(70) = 3.436$; $p < 0.05$ shows that

Wikitechnology can support group work and $t(64) = -4.451; p < 0.05$, that learners equally participate to the group work whilst using the technology.

Results from the reflective Blogs show that learners valued the Wiki in undertaking the group based assessment and fostering a learning community, demonstrating that both people and task aspects are important when considering the design of a blended face to face and online learning experience. People oriented learners cited being comforted by each other and that being online saves face. Task oriented learners value the opportunity to manage their own learning and learning environment.

Introduction

There is a number of driving forces in Higher Education (HE) to use online technology to support teaching and learning for example, the Department for Education and Skills e-learning strategy (DfES, 2005), and the Higher Education Funding Council e-learning strategy (HEFCE, 2005) in particular, the focus on 'personalised' learning through the 'harnessing' of new technologies. With the availability of the infrastructure, and emerging technologies such as Wiki, online social software can be used as a resource to shift the emphasis from the tutor to the student and as a tool for collaborative learning enabling students to personalise their own learning,

Socio-constructivism postulates that knowledge construction is a social process that occurs through collaboration with others. Collaborative learning has been shown to engage learners in knowledge sharing, to provide support, where learners can depend upon another, negotiate and manage their own learning needs (Tu 2004). A key concept of integrating collaborative learning into online learning is providing a sense of community. This has been defined by Tu & Corry 2002 as “..a common place where people learn through group activity to define problems affecting them, to decide upon a solution and to act to achieve the solution”. There is considerable research to characterise communities (Mc Connell 2006; Paloff & Pratt 1999; Wenger 1998). However, there is limited research into what actually happens in online communities (McConnell 2006). Moreover, there is limited research into the use of collaborative learning in a blended learning environment (Baskin et al, 2005). In this blended learning environment, technologies are integrated with conventional class based activities.

Therefore, this study investigates the integration of collaborative learning using a Wiki in a blended learning environment to help understand a sense of community. The intention of the study is to gain an understanding of the learner experience, their attitude and feedback relating to the use of a Wiki to support group based assessment in an attempt to understand the effects of such systems in the development of a sense community. These issues are

explored by using qualitative and quantitative methods as described in this paper.

The Online Learning Environment - Wiki

Wiki is steadily gaining place in the Higher Education e-learning environments. A Wiki is a collaborative authoring tool which can be used to build a community of learning and a shared learner knowledge base. It is essentially a shared “white board” and any text entered by any author can be added to and edited by any person (with permission in this example through a login procedure), just by using a web browser; hence a Wiki looks and feels like a normal Intranet or Internet web site. Hyperlinks to other pages are created easily thus providing the opportunity for learners to construct their own learning environment and pathways through to other resources and take control of their own learning, in addition to co-authoring text Wiki supports images, sound, and video.

In this study, a ‘Jotspot’ Wiki was used. This Wiki is freely available and provides the Wiki functionality and the server space for storing the pages. Learners gained access to Wiki via the University Managed Learning Environment (MLE). Using the web link <http://uh-isd1.jot.com> the learner is presented with the login screen and is required to input a username. In this example, the learner’s email address and a password is chosen by the learner on first login.

The Wiki was integrated with conventional teaching practices and was intended to provide more opportunities for learners to interact with each other outside the classroom in order to undertake the group based assessment. These interactions were intended to provide learners with a stronger sense of being connected to one another, and increased construction of knowledge through co-creation of content and discourse, thus providing stronger feelings that educational goals were being satisfied by the learners and indeed a sense of belonging to a 'community of learning'.

Methodology

The Study

This study was carried out over a one-year period with ninety six second year learners studying an Information Systems Development course. The study was exploratory and was intended to gain an understanding of learner experiences of using a Wiki to support the group based assessed activities, their attitude to using the Wiki and to gain an understanding of a sense of community. Doolan (2006) describes effective strategies for building a learning community online including the importance of preparatory work by the academic, involving their role as tutor to create an engaging online learning environment to encourage collaborative task driven student-student interactions. Therefore, learners were divided into groups of six which were randomly selected. There were a total of sixteen groups numbered from one to sixteen. The group number related to their group space in the Wiki. These

learners had never undertaken a group assessment in this course of study and were generally not familiar with the members in their group prior to undertaking this study. Therefore, a group list was attached to their group space on Wiki and learners were required to complete an introductory assessed task as described below. The learners' personal group space on Wiki was to enable learners to work securely to complete the five set tasks for the assessment as summarised below. Active learner engagement requires the chosen activities to be shared equally within and across the group, (Doolan et al, 2006) enabling personalised learning and autonomy (DfES 2005). Therefore, learners also had access to a shared communal Wiki space and through the set activities were actively encouraged to share resources, news and problems in the communal space accessible by the whole cohort of ninety six learners once they had entered the homepage of the Wiki. Each of the sixteen learner groups were required to complete a report as part of their assessment, which consisted of five set activities, summarised as follows:

Task 1: Group Commitment where learners had to provide group information, an object or photo, which represented them and basic planning for the problem.

Task 2: Eliciting and documenting requirements related to gathering the requirements for a software development task.

Task 3: Support for project stakeholders reporting on issues of design of an appropriate computer system.

Task 4: Evaluation of the design of the new computer system.

Task 5: Production of a group reflective log using a Blog.

In performing the tasks, a range of communication, information gathering and role play activities were employed. Using a case study learners were required to carry out a thorough analyses and design of a computer system using the Wiki, to complete individual and group work activities according to the needs of the group. The overall learning objective is to apply the principles and techniques of system development in a team environment, thus fostering and developing collaborative working skills. This requires learners to move from problem identification through to implementation and evaluation.

Full assignment specification including activities, assessment criteria and templates were made available to learners in the communal space on Wiki and a summary was presented in a lecture. Learners were made aware that all activities were to be assessed after the final submission deadline and were provided with two lectures on group work. An introduction to the Wiki took place through a live demonstration in a lecture when distributing the summary assignment specification. It was not felt necessary to train learners to use the system as these learners were introduced to the university MLE in their first year of study and were already familiar with using MS Word and MSN.

Data Gathering

Data collection included both quantitative and qualitative methods. Quantitative data came a pre and post-test questionnaire, which was undertaken one week prior to the start of the study and one week after completion of the study. The questionnaire was distributed during a taught lecture using an EDPAC answer sheet and results were fed through an optical mark reader. The questionnaire was designed using a Lickert type response 'A' to 'E'. Where 'A' indicates 'Strongly Agree', 'B' indicates 'Agree', 'C' indicates 'No View', 'D' indicates 'Disagree' and 'E' indicates 'Strongly Disagree'. Data was coded into SPSS and a paired samples T test was performed to test the significance of the difference in the results of the pre and post test questionnaires.

Qualitative data analysis was in the form of learner reflective group Blogs as the sixteen groups of learners were required to complete these as an assessed task. The Blogs were analysed and coded based on specific topics raised in the Blogs and open in their nature. These were guided by questions specifically designed to encourage learners to reflect upon and evaluate their own experiences in terms of community and technology use as an attempt to understand the effects of such systems in the development of a community and in the context of supporting group based assessment. Quantitative data came from these coded responses.

Results

Pre and Post-test Questionnaire

Of the ninety-six students who undertook this study, 77 (80%) responded to the pre test questionnaire and 76 (79%) to the post test questionnaire.

The results are shown in figures 1 - 6 below. 'SA' indicates 'Strongly Agree', 'A' indicates 'Agree' and classed as 'Positive Responses' 'SD' indicates 'Strongly Disagree' and 'D' indicates 'Disagree' and classed as 'Negative Responses'.

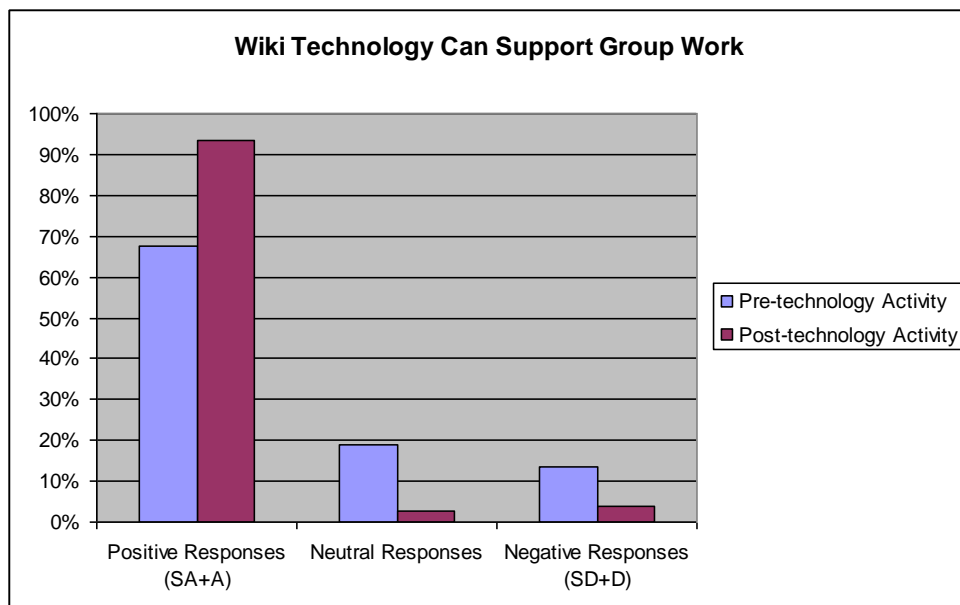


Figure 1: Wiki technology and support for group work

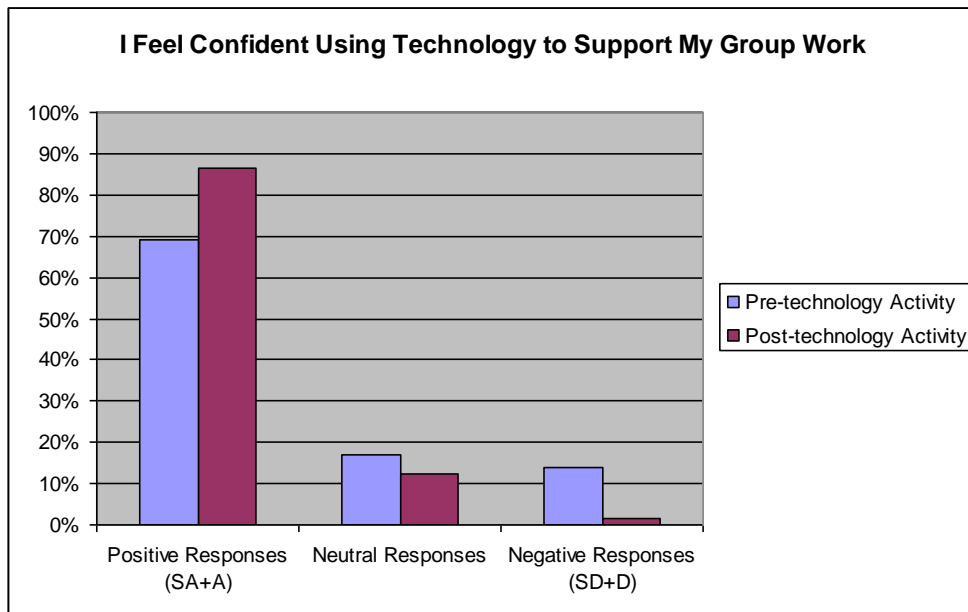


Figure 2: Learner confidence in using the technology to support group work

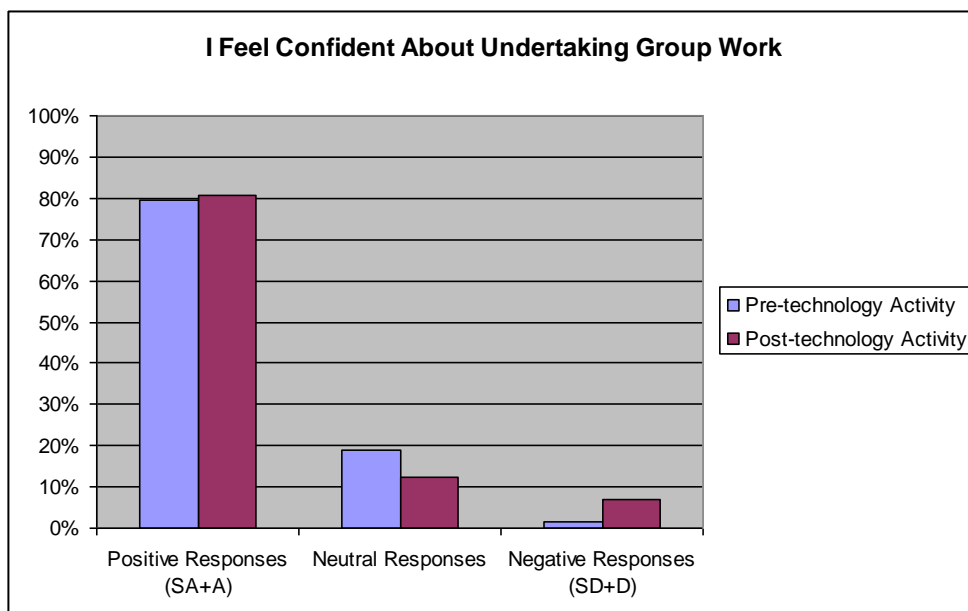


Figure 3: Learner confidence levels in undertaking the group based assessment

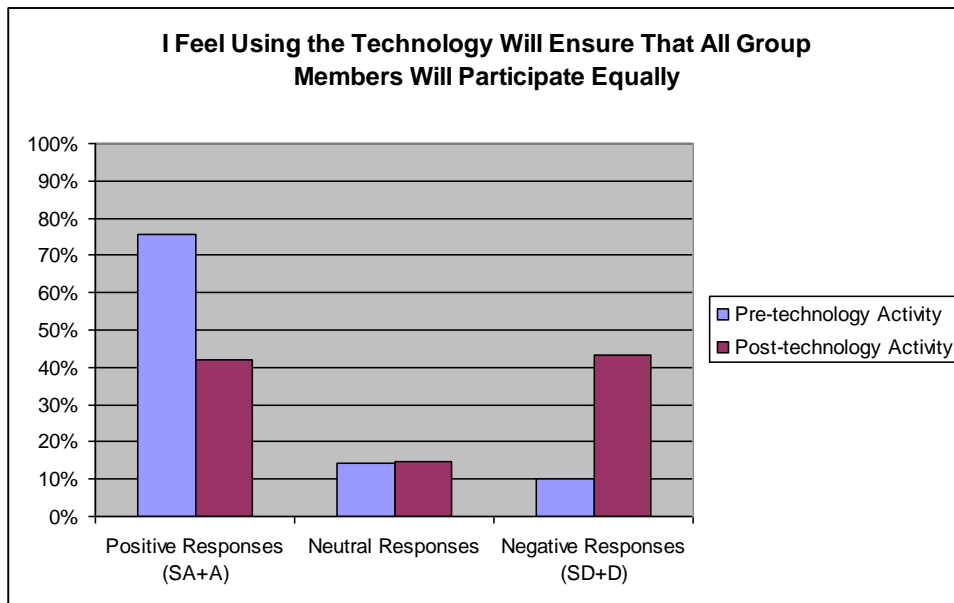


Figure 4: Learner participation and equality in group work

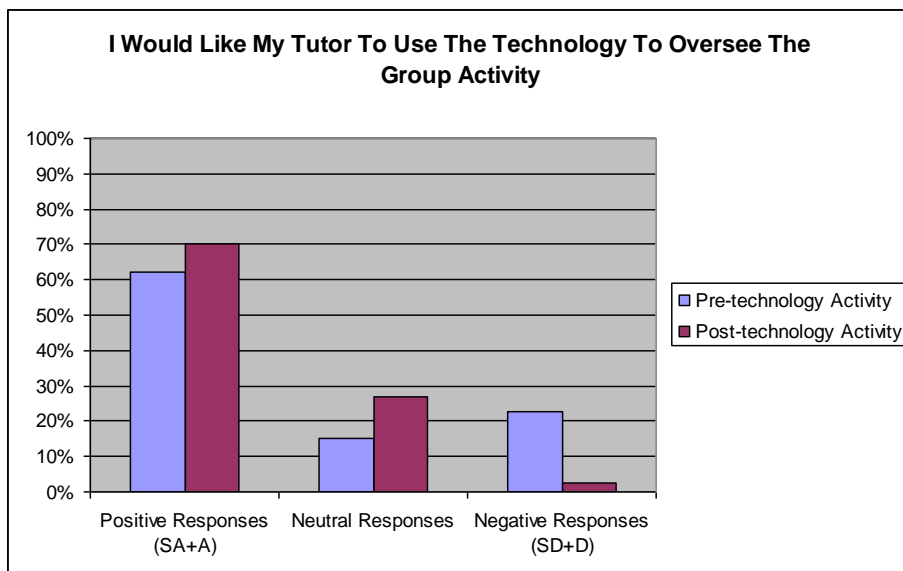


Figure 5: Tutor Role and Group Work

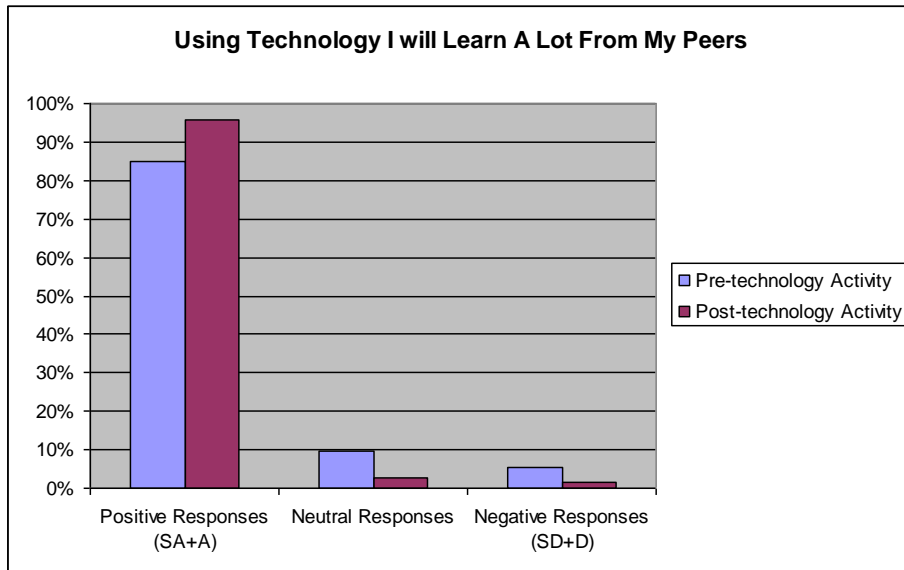


Figure 6: Learning from others in the community

Results from Reflective Group Blogs are presented below:

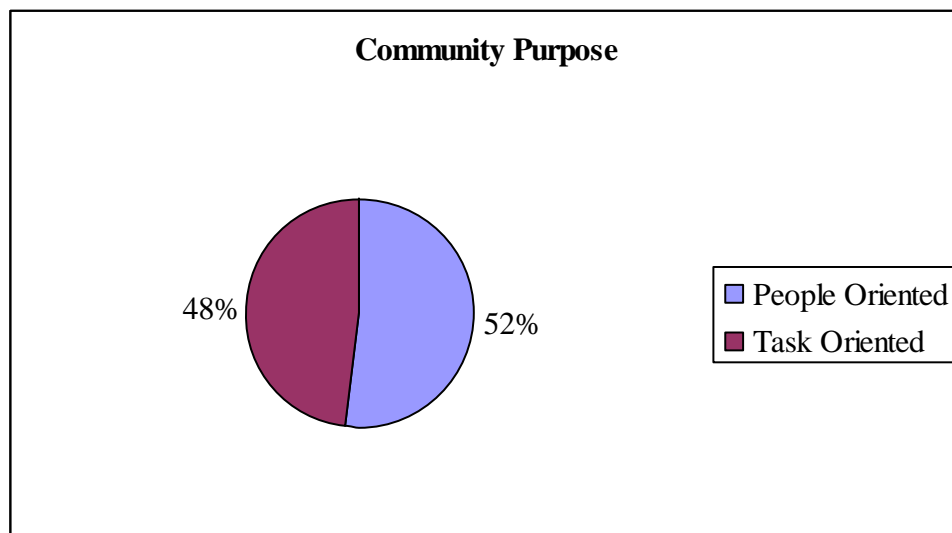


Figure 7: Learner perception of community

Out of a total of 88 comments provided by all 16 groups, 45 comments (52%) related to 'People Oriented' reasons as to what learners cite as the purpose of community.

Table 1 below provides examples of student comments in relation to the 'People Oriented' aspects.

"to contribute various ideas and opinions"
"to communicate regularly"
"to find someone who knows the answer to your question and is willing to help you"
"to share their views and ideas"
"to interact"
"we could communicate together as a team"
"to have connections"
"to work together to collectively complete an assignment"

Table 1: Learner rationale for community - PEOPLE

42 out of 88 comments (48%) related to 'Task Oriented' as the purpose for their community.

Table 2 below provides examples of student comments in relation to the 'Task Oriented' aspects.

"to achieve the objectives and the tasks set"
"to complete the group assignment"
"to produce effective results"
"to complete each task within the required time"
"to ensure the successful completion of all tasks"
"to pass ISD2"
"to do the assignment"

Table 2: Learner rationale for community -TASK

Table 3 and 4 below provide examples of learner positive and negative comments relating to using the Wiki. Overall, learner attitude and feedback relating to the use of a Wiki to support group based assessment was positive with few students expressing negative comments.

“face to face could lead to members going off topic compared to online is very unlikely to happen”
“everyone contributes and there is a record for reflection after the event”
“the communication was less personal which could make the individual feel comfortable”
“provide confidence to the individual to effectively contribute their ideas”
“feel free to say what they are really thinking online so better expression online”
“access from almost anywhere, using mobile phones, laptops”
“you can reply at your own time when it suits you”
“we all have a username and password to see our assignment online securely at any time”
“so if I put my idea forward either in text, images or diagram and am not correct someone else in our group can edit it”.

Table 3: Examples of Learners Positive Comments

“it is hard to judge someone without even meeting them”
“fellow group members may rely on other group members to do their work group”

“no visual audio feedback people may take things the wrong way”
“lack of true response, facial expression”

Table 4: Examples of Learners Negative Comments

Discussion of Findings

This study sought to investigate integrating collaborative learning using a Wiki in a blended learning environment to help understand a sense of community. The results from the group reflections demonstrate that learners perceived that the community had a purpose and that purpose was to support them in undertaking their learning together both to support them as people and the tasks set for the group based assessment. Indeed a learner cited *“to find someone who knows the answer and is willing to help you”*. Learners equally valued the opportunity to work collaboratively whilst carrying out set tasks for the assessment. They valued the opportunity to learn together, work together, share and discuss ideas, to support and help each other. According to Wenger (1998) a sense of community is about belonging, learning from one another, having an objective, a goal, a reason for joining the community and to revisit the community. In this study, learners demonstrate this sense of belonging *“so if I put my idea forward either in text, images or diagram and am not correct someone else in our group can edit it”*.

What was also evident from the group reflections is that learners valued the Wiki in undertaking the group based assessed activities and fostering a

learning community, demonstrating that both people and task aspects are important when considering the design and implementation of a blended face-to-face and online learning experience. The results also show that the group process was supported by the Wiki. Learners were able to share their views and ideas, to connect and contribute to the group process. They were able to review and edit other members work; the opportunity to use a jointly collaborative authoring tool helped with this.

The results highlight the importance for 'task oriented' learners of having the opportunity to manage their own learning and learning environment as learners cited the importance of achieving the objectives and set task in order to successfully complete the assignment within the required time, to produce effective results and pass the course. This was particularly evident in the students whose rationale for community was task orientated "*to achieve the objectives and the tasks set*".

An interesting finding is that students were 'comforted' by each other in the community as some of them stated being online saves face. "*the communication was less personal which could make the individual feel comfortable*" and "*feel free to say what they are really thinking online so better expression online*". The students also reported an added sense of confidence and felt encouraged by their group members to participate. Also

they were not overly concerned about making mistakes indeed they reported they felt that other group members would be willing to correct their mistakes.

It is evident from the pre and post-test results that once learners completed the group assessed tasks that their perception of Wiki and group work had changed. There was a 17% increase in learner confidence in using the technology to support group work as illustrated in figure 2 and the result of a paired samples test $t(64) = 2.527$; $p < 0.05$ shows a significant difference in the results. This supports the hypothesis that confidence was improved for learners in using the technology to support group work. There was a 26% increase in learner perceptions that Wiki technology can support group work as illustrated in figure 1 and the result of a paired samples test $t(70) = 3.436$; $p < 0.05$ shows a significant difference in the results. This supports the hypothesis that the technology can support learners whilst undertaking group work.

Similar problems as in conventional group based assessment (such as face-to-face), arose when using the Wiki; when learners were presented with the statement "I feel using the technology will ensure that all group members will equally participate" figure 4 shows a 34% decrease in positive responses in the post test result. The result of a paired samples test $t(64) = -4.451$; $p < 0.05$ shows a significant difference in the results which rejects the hypotheses that learners equally participate to the group work whilst using

the technology. This may have resulted in the 10% increase in learners wanting the tutor to oversee the group work process as illustrated in figure 5.

Despite some negative comments learners overall had a positive attitude to using the Wiki for undertaking the group based assessed tasks. The data derived from the reflective Blogs provided evidence of the kinds of learner engagement with the Wiki and the learning process. This is an important measure of learner use of the Wiki to support collaborative working and learning and a sense of community. Learners valued the Wiki in particular the opportunity to work on tasks any time any place and at their own pace. They valued the opportunity for reflection before responding to others and liked that Wiki kept a record of these reflections as important in their learning. They valued the communicative aspects that Wiki affords *“so if I put my idea forward in text, images or diagram and am not correct someone else in our group can edit it”*.

There was evidence that some learners were concerned that not all group members equally participated to the group work. This was an important finding in this study and highlights the need to investigate further to put in place mechanisms to ensure that learners are encouraged to equally participate in the group work process. In addition, it is important to ensure that learners are not disadvantaged by using technology.

Some learners showed concern about the lack of 'true' responses, facial expressions, and that others may misinterpret edits to Wiki. These communication difficulties online and the need to physically be in contact with other group members have been widely reported by (Guernsey 1998; Larson 1999; Hiltz 1998; as cited in Valenta 2001). Doolan & Barker (2005) similarly found that students preferred face-to-face contact in many online group situations.

An interesting finding from this study was that some learners valued the restricted access to the Wiki via password given the nature of Wiki is generally 'open' citing that they found the restricted access particularly useful in creating a safe and sheltered environment, which is important in nurturing a sense of community.

Conclusion

Using Wiki technology offer a major opportunity to personalise the student learning experience enabling learners to co-create their own learning content, knowledge, and environment social constructivism. However, the uses of these technologies are in their infancy. Therefore, it is important to ensure that learners are not disadvantaged by using these technologies. On a personal note, this study has provided valuable insights into the individual

learner experiences and group processes in a system of mass Higher Education helping me to reflect and review my teaching, learning and assessment practices whilst helping learners develop a sense of community. Technologies such as Wiki in addition to, providing new learning opportunities, they are relatively easy to set up and use. A critical success factor is the learning design much of which is the transfer and adaptation of existing good conventional teaching, learning and assessment practices.

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Biography

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Doolan, M. A. (2007b) 'Our Learners are the Net Generation Growing up in a Digital World. How then do we Engage with and Support this Type of Learner?'. In: *Proceedings of the 6th European Conference on e-Learning*, 4-5 October. Copenhagen, Denmark: Copenhagen Business School pp.159-172.

C.iv Our Learners are the Net Generation Growing up in a Digital World. How then do we Engage with and Support this Type of Learner?

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Abstract: Web 2.0 social software offer new pedagogic opportunities to support and empower the Net generation of learners to create their own personal learning agenda and dynamic learning environments. This paper presents learners experiences of using Web 2.0 social software, such as videos and podcasts linked to Wiki contributions in a collaborative online learning environment. In addition to, a private Blog which was provided for learner reflections and the University Managed Learning Environment (MLE): which included a private group area and a discussion forum to support the group based assessment. Within the Wiki environment, learners were

presented with the learning design by the tutor using text, short videos and podcasts created using Web 2.0 technologies. Learners were given a choice in selecting the most appropriate technology to complete their individual and group tasks and to present these as a group linked to Wiki contributions.

This paper outlines the setting up and the implementation of a multi-mode assessed collaborative student learning environment and identifies the different approaches used by learners. Evidence is provided from learners' contributions to the core task captured through the Wiki, and in the form of illustrations of Wiki contributions and images of video recordings. Learner attitude was measured using a pre and post test questionnaire and by students own reflections of their lived experiences captured using a Blog.

There are some interesting findings including the learners preferred technology for learning, and alternative technologies used which were not provided in this study. In addition, findings are presented relating to what learners did with the different technologies, including student approaches to learning, how the technologies helped or hindered learning and learner attitude to the use of the alternative technologies. These findings will add to the debate on how we engage with and support the Net Generation of learners.

Keywords: The Net Generation, Collaborative Learning, Web 2.0, Social Software, Wiki, Social Constructivism.

Introduction

There is a number of driving forces in Higher Education (HE) in the UK to use online technology to support teaching and learning for example, the Department for Education and Skills e-learning strategy (DfES, 2005), and the Higher Education Funding Council e-learning strategy (HEFCE, 2005) in particular, the focus on 'personalised' learning through the 'harnessing' of new technologies. With the availability of the infrastructure, and emerging new web 2.0 social software technologies such as Wiki, Blogs, Podcasting, and video editing software. Online social software can be used as a resource to shift the emphasis from the tutor to the student, and as a tool for collaborative learning enabling students to acquire the necessary skills for the workplace and at the same time personalise their own learning. Personalisation provides learners with the opportunity to choose technologies and methods that are most appropriate to support their learning and just-in-time to undertake their learning activities. There are further demands for curriculum revision and to, adapt learning and teaching practices to accommodate the 'The Net generation' learner (Oblinger, 2005) and the 'Digital Native' (Prensky, 2001). These learners have grown up with technology this generation sees technology as an 'enabler' and they are active information seekers with a need to undertake activities with

immediacy, from anywhere, and at anytime. Whilst at the same time, not afraid to 'push' the technology to its limits. These learners are connected and equipped with the latest technologies such as mobile phones, wireless PDAs, or laptops.

Socio-constructivism postulates that knowledge construction is a social process that occurs through connectivity and collaboration with others. This paradigm is most appropriate for the 'Net generation of learners' as they are known to engage and interact with each other through various technologies such as text on a mobile phone and they commonly use Microsoft Instant Messenger (MSN) for chat. These learners tend to embrace interactivity and collaborative learning these result in new learning and teaching strategies in collaborative learning that are aligned with learner styles and expectations (Doolan, 2006). Collaborative learning has been shown to engage learners in knowledge sharing, to provide support, where learners can depend upon another, negotiate and manage their own learning needs (Tu 2004). In this example, group work and collaborative learning is an essential skill for the workplace given that these learners are potential IT professionals. With no work placement opportunity on this course it is essential that learners have the opportunity to practice and develop these skills whilst undertaking this course.

The intention of the study is to gain an understanding of the learner experience, their attitude and feedback relating to the use of alternative Web 2.0 social software in addition to, the University Managed Learning Environment (MLE) to support group based assessment. In an attempt to understand learner technology preferences and to gain an understanding of the use of technologies chosen by learners and not included in this study. Furthermore, to gain insights into the 'Net generation of learners' journey in terms of how learners used alternative technologies, their approaches to learning, the quality of the learning experience and the effects of such technologies in supporting group based assessment. These issues are explored by using qualitative and quantitative methods as described in this paper.

The Set up and Implementation

This study was undertaken by sixty second year learners studying an Information Systems Development course as part of an undergraduate computing programme of study. Learners are required to work in groups of six on group and individual assessed activities. Active learner engagement requires the chosen activities to be shared equally within and across the group, (Doolan et al, 2006) enabling personalised learning and autonomy (DfES 2005). Therefore, the learners were divided into groups of six which were randomly selected from a class list and provided with group areas in Wiki and the university MLE in addition to, shared communal areas by the

whole cohort of sixty learners. Learners also had access (in addition to, Wiki) to alternative Web 2.0 social software including podcasting (audio), Jumpcut (video editing software), and Blogs for individual reflections on the group process. Learners were actively encouraged through the learning activities to co-create content, to share this content in terms of products produced and reflect on the experiences using a Blog as part of the assessed tasks.

The Core Task – Problem Identification

The core task was provided by the tutor in the following formats: video, podcast and script and this was made available in the communal area in the Wik in addition to, an overview delivered in a lecture. The core task consisted of a software development task in which learners were expected to elicit and document requirements using the template provided by the tutor and related to gathering the requirements for a software development task. Based on a realistic case study using role playing as ‘developers’ and ‘clients’ in groups learners were expected to:

Choose a method: interviewing, direct observation, brainstorming or another method of your choice. Agree this on the Discussion forum on the MLE by a set date. Students were expected to state the technology they intended to use to carry out the task and if they had the resources to undertake the task.

Record using one or more of the following: video, webcam, audio, podcast, document in Wiki or capture ideas using the discussion forum, or another method of your choice.

Add the results/product in Wiki show, share work and gain feedback from “a set of potential users”. Learners were required to submit their product in the communal area in Wiki and gain feedback from another group.

Use feedback obtained from the group to complete the ‘Requirements Document Template’ provided to document the requirements.

The overall learning objective is to apply the principles and techniques of system development in a team environment, thus fostering and developing collaborative working skills. This requires learners to move from problem identification through to implementation and evaluation therefore, the ‘core task’ the problem identification (requirements elicitation and documentation) phase is crucial in the software development process with all other tasks built on this. Each of the ten learner groups were required to complete a report as part of their assessment,

Data Gathering

Data collection included both quantitative and qualitative methods. Quantitative data came a pre and post test questionnaire which was undertaken one week prior to the start of the study and one week after

completion of the study in an attempt to measure the learner experience, their attitude and gain some feedback relating to the use of alternative Web 2.0 social software in addition to, the University MLE to support group based assessment. The questionnaire was distributed during a taught lecture using an EDPAC answer sheet and results were fed through an optical mark reader. The questionnaire was designed using a Lickert type response 'A' to 'E'. Where 'A' indicates 'Strongly Agree', 'B' indicates 'Agree', 'C' indicates 'No View', 'D' indicates 'Disagree' and 'E' indicates 'Strongly Disagree'.

Qualitative data analysis was in the form of learner individual reflective Blogs as the ten groups of learners were required to complete these as an individual assessed task. The Blogs were analysed and coded based on specific topics raised in the Blogs and open in their nature. These were guided by questions specifically designed to encourage learners to reflect upon and evaluate their own experiences and learners were required to provide an attitudinal measure using a Lickert scale where 1 represented poor, 5 average and 10 an excellent learning experience in an attempt to gain insights into the 'Net generation of learners' journey in terms of how learners used alternative technologies, their approaches to learning, the quality of the learning experience, their attitude and the effects of such technologies in supporting group based assessment

Results and Findings

Qualitative Data Analysis - Pre and Post test Questionnaire

Of the sixty students who undertook this study, 55 out of 60 responded to the pre and post test questionnaire.

The results are shown in figures 1-9 below. 'SA' indicates 'Strongly Agree', 'A' indicates 'Agree' and classed as 'Positive Responses' 'SD' indicates 'Strongly Disagree' and 'D' indicates 'Disagree' and classed as 'Negative Responses'.

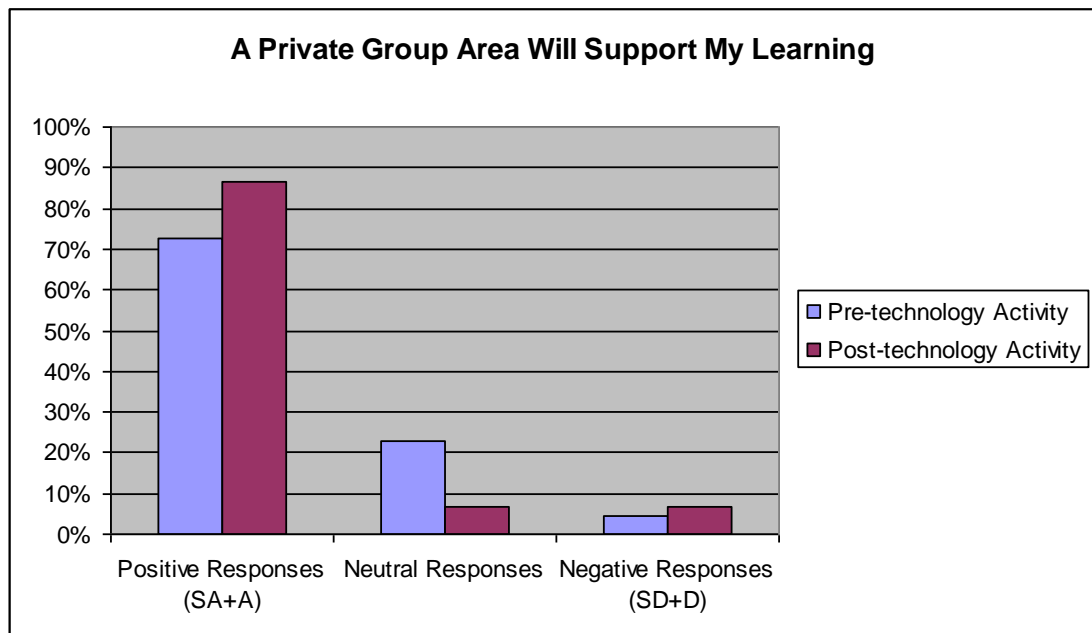


Figure 1: Private group area in Wiki and MLE

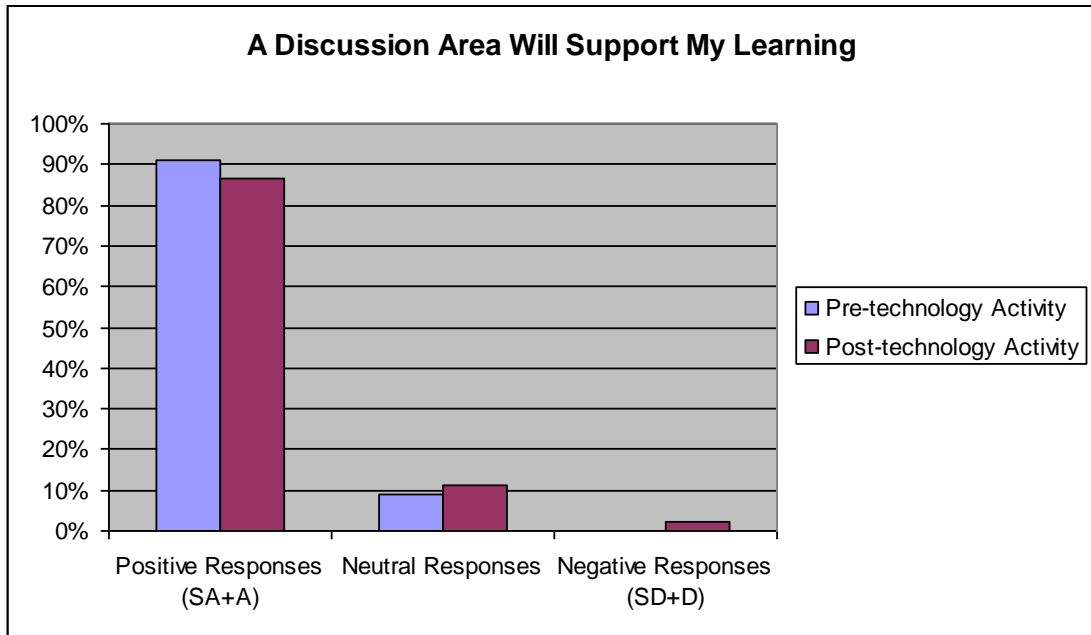


Figure 2: Discussion feature provided in the MLE

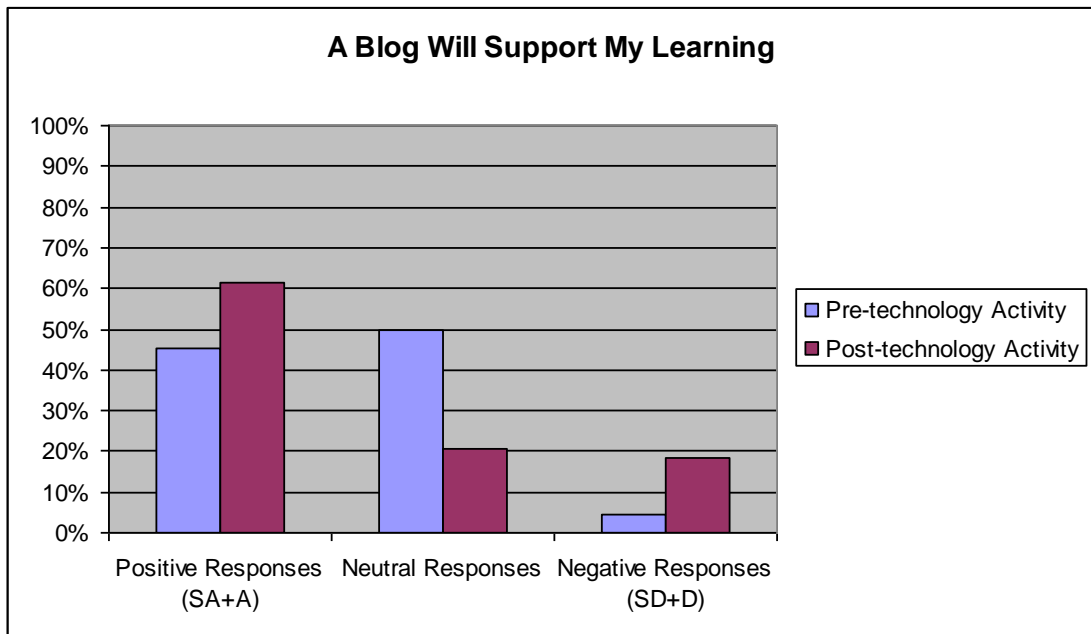


Figure 3: A Blog was provided to keep reflections

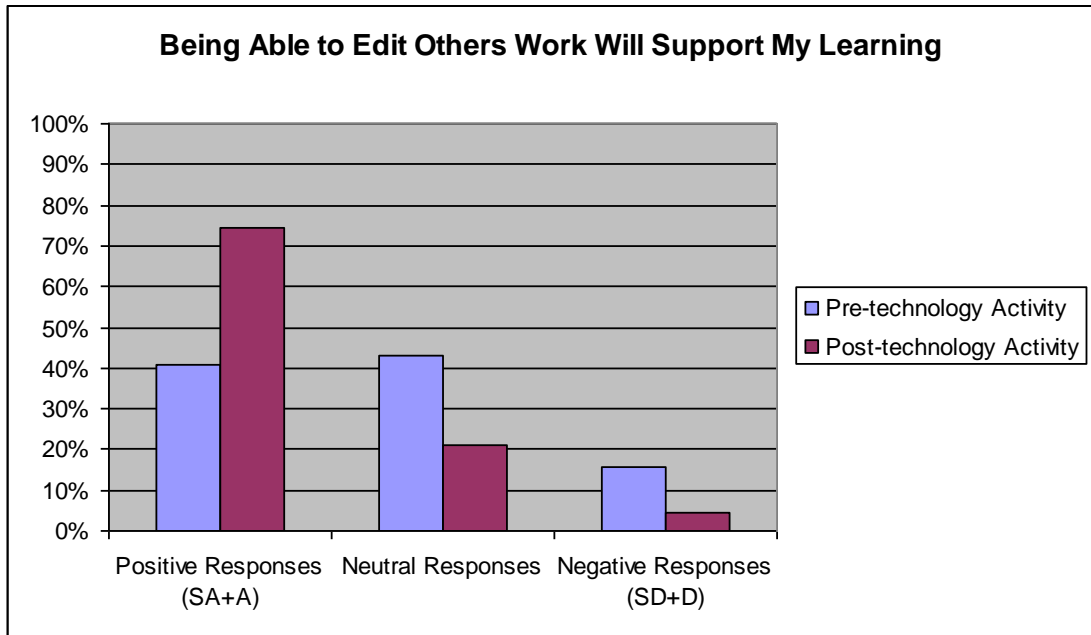


Figure 4: Wiki enabled co-creation of content

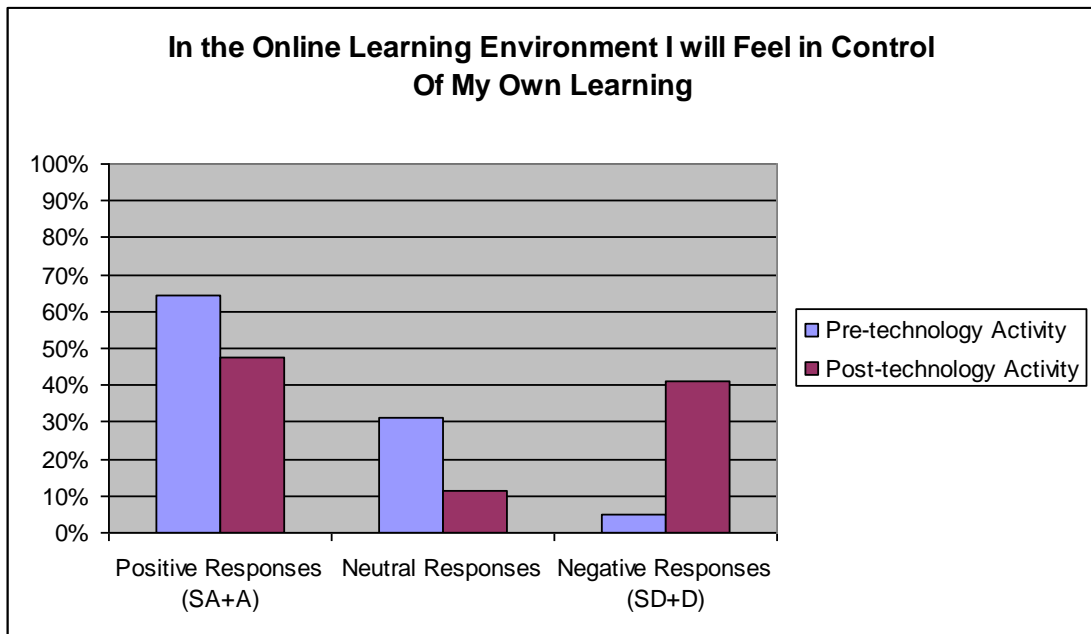


Figure 5: Blogs, Wiki, Podcast, Jumpcut (Video), and MLE

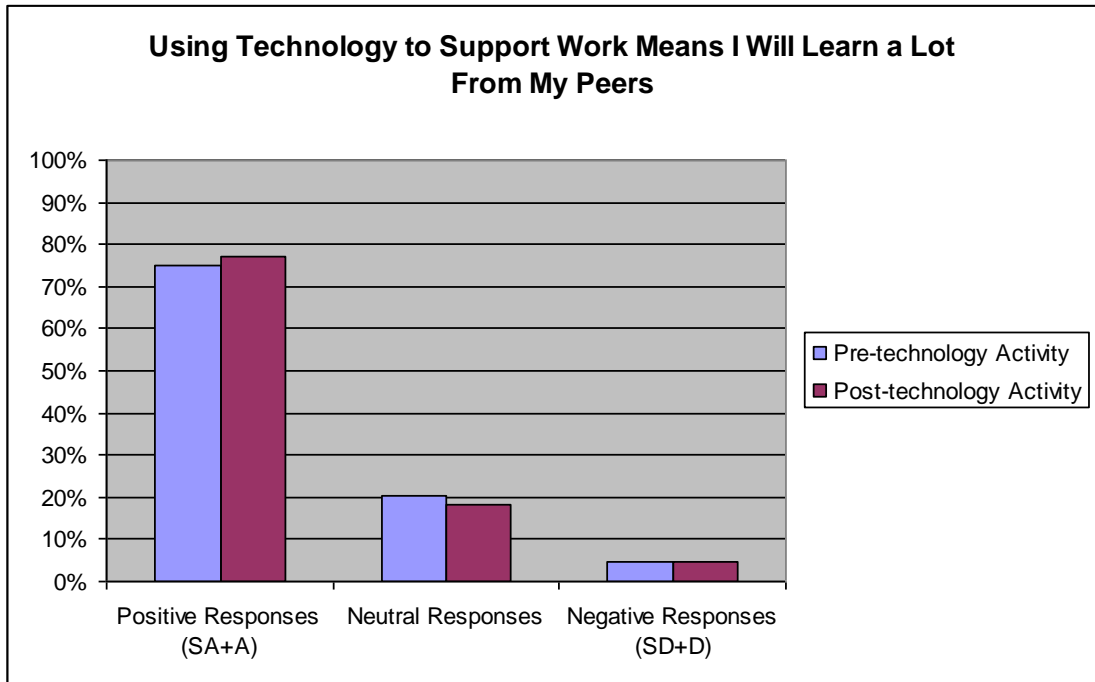


Figure 6: Blogs, Wiki, Podcast, Jumpcut (Video), university MLE

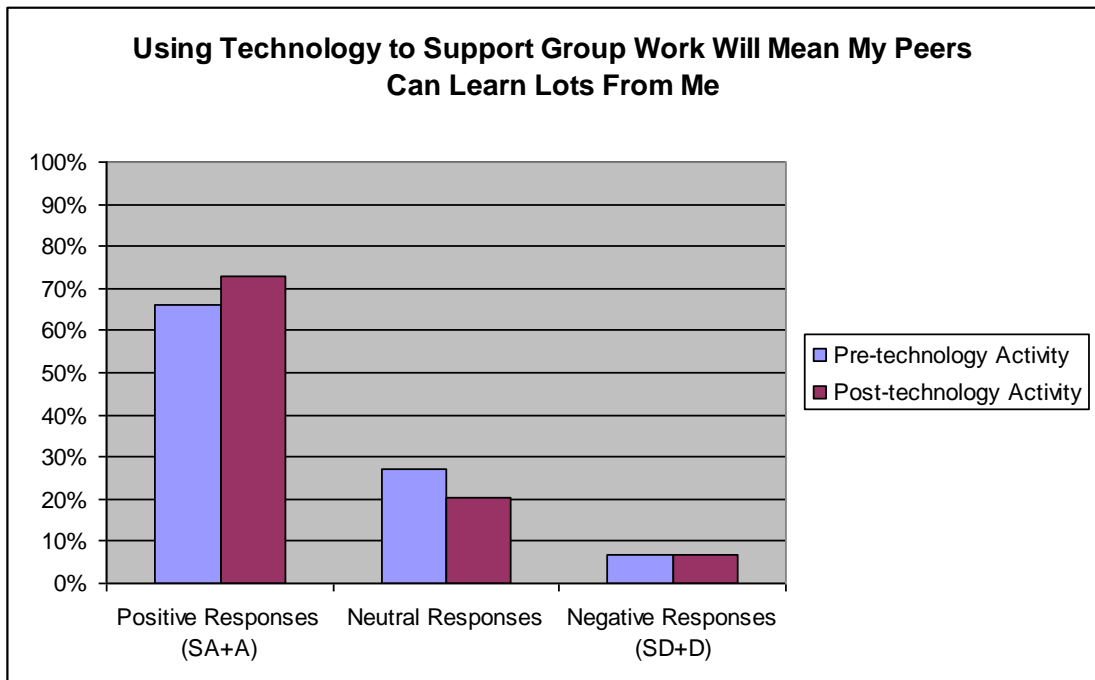


Figure 7: Blogs, Wiki, Podcast, Jumpcut (Video), and MLE

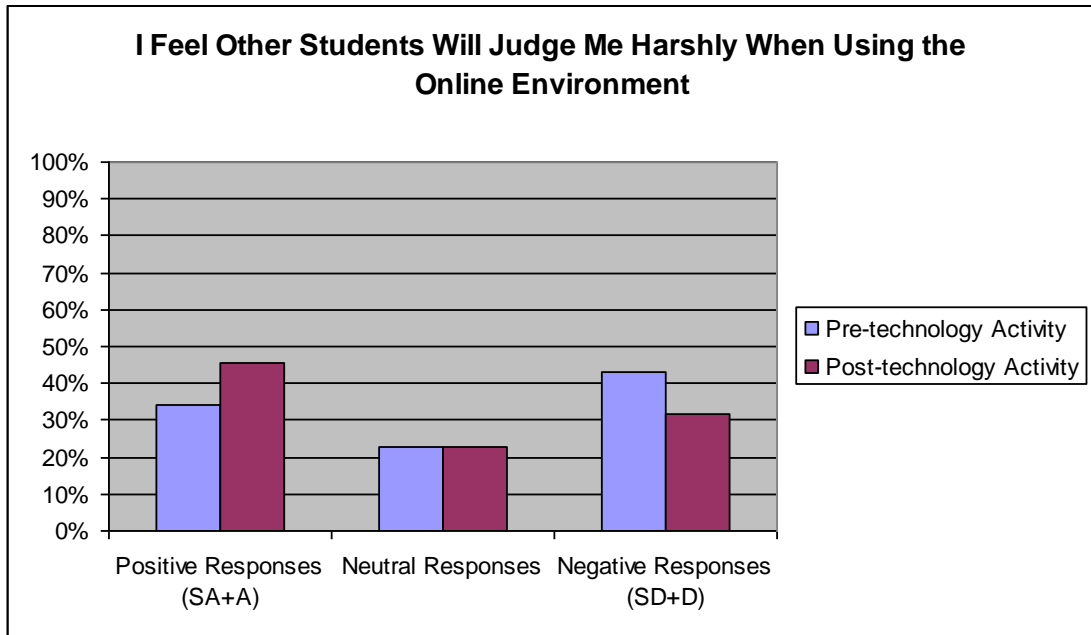


Figure 8: Blogs, Wiki, Podcast, Jumpcut (Video), and MLE

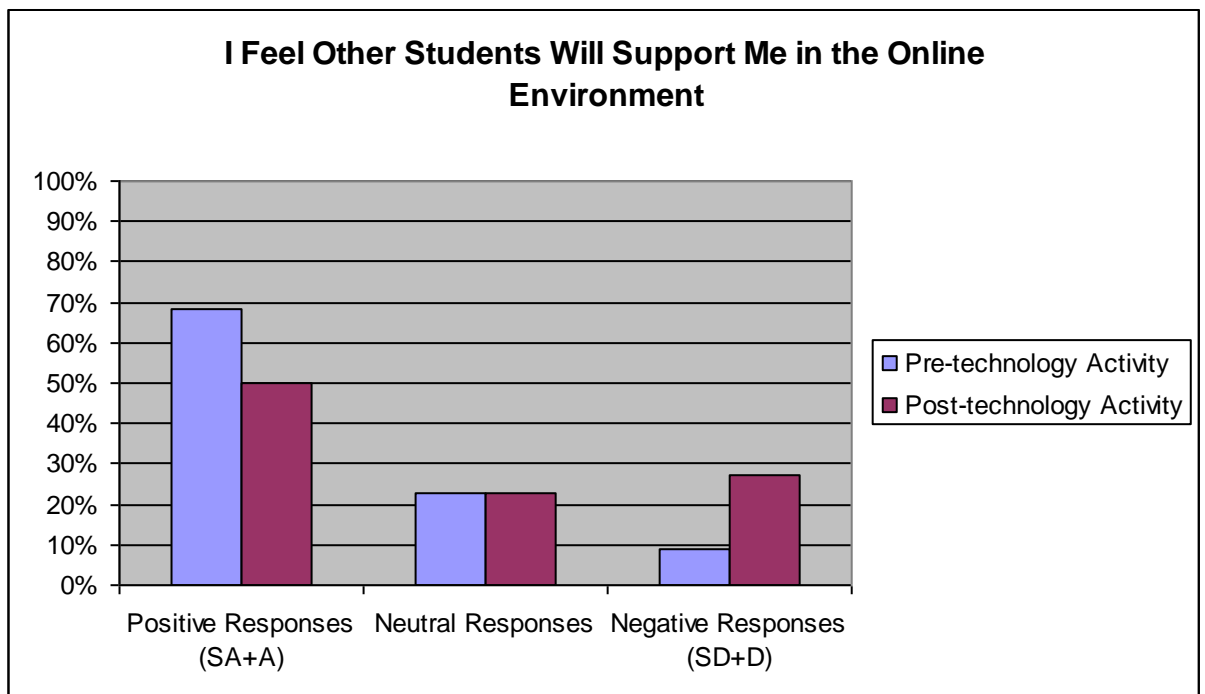


Figure 9: Blogs, Wiki, Podcast, Jumpcut (Video), university MLE

Quantitative Data Analysis – Learner Reflections

Results from the qualitative data show that 8 out of 10 groups used their mobile phone to complete the core task for the group based assessment. 2 groups chose to make a podcast and link this to Wiki contributions. One group provided a transcript of their group podcast.

Some groups chose to carry out an interview and brainstorm to undertake the core task and record this using a mobile phone. Learners transcribed the process in the form of a script and attached this script to the Wiki page to share with the cohort. These group members decided to edit the video using the Jumpcut video editing software and stored the video on the Jumpcut server. The learners then created a link to the video and placed this on the communal area in Wiki to obtain feedback from another group as in Figure 10. A different group of learners composed the feedback on a Wiki page and created a link in the communal area in Wiki to share with other groups. This feedback was then used and incorporated into the Requirements Document template provided by the tutor and included in the group assessed report.

Group 9 Interview/Brainstorm
The following link shows the recording by a team of Software System Developers (Group9) who use a combination of an interview and brainstorm to capture the requirements of a small system named 'Little Horrors Child Minding Agency'.
Below is the link to our recording which we did using mobile phones. We then used jumpcut to add a few extras, and as a place for it to be viewed.
<http://www.jumpcut.com/view?id=7CC84AAC78A511DB8AD23EF340157CF2>
Below is a link to see exactly what was said during the Interview/brainstorm if the recording can't be heard.
Go to the following link to see the script: [Script](#)

Figure 10: Group Wiki contribution

Figure 11 and Figure 12 below illustrate videos produced by groups. In figure 11 the student opening the door is playing the role of a 'developer' and is intending to greet other group members who are playing the role of 'clients' prior to undertaking the interview and brainstorming session to capture the requirements for the software system. Figure 12 shows a student group undertaking the interview for the core task of the assessment.



Figure 11: Group Role Play Interview and Brainstorm Video



Figure 12: Group Role Play Interview Video

In addition, to videos 5 out of 10 groups (half) provided a script in Wiki of their group recording, one group provided a scenario as in Figure 13. This group of learners decided to role play making a phone call as ‘developers’ to the ‘clients’ in advance of carrying out their interview. This group of learners created a scenario as in Figure 13 of this. This scenario was followed by 3 videos as in Figure 14 and contributions were provided in the Wiki for other groups to share and provide feedback. Reflections on the process are captured using a Blog and presented in Figure 15

Scenario

This is a phone call between Emma, the project manager from Group One Developers and Mr Patel the managing director of Little Horrors Child Minding Agency. The purpose of the call is to set up an initial interview to ascertain the needs and wishes of the client in order to Identify, Describe and Validate the clients' requirements.

Emma: Hello Mr Patel, this is Emma from Group One. I'm just calling to set up an interview with you and Mrs Patel so that we can discuss your requirements with regard to setting up the new computerised system for your business.

Mr Patel: Oh ok, why is that necessary then?


Emma: Well when we start work on a new system, the most important thing for us to understand is what you need the system to do. If we don't get that right, the system may not work for you. It won't collect the information that you need to make strategic decisions for the future. We could create a system that we think does the job but without input from you and all the other stakeholders we could end up going in completely the wrong direction.
There are several ways of trying to understand what you need and an interview is only one of them. We

Figure 13: Group Scenario in Wiki

Group 1 Interview ★ edit page shared set permissions

Version 8, changed by 1/11/2006. [Show version history](#)

Group 1 Requirements Elicitation Method : Interview



Here are the links for the Interview that was carried out by Group 1 on the Little Horrors Childminding Agency to find out what sort of system they required.
All of the links are videos and were edited on jumpcut.com, where they are also viewable.

The first link is a phonecall that was made by Emma the Project Manager from GroupOne, to Dhires from Little Horrors to arrange an initial interview. The Phonecall script is kept at the bottom of the page.

<http://www.jumpcut.com/view?id=042C42C8737911DB92453EF340157CF2>

The second Link is the first part of the interview and the second document at the bottom is the script as the sound may be hard to hear in some areas.

<http://www.jumpcut.com/view?id=143406FC74F911DB8B75A856F9CC894>

The third link is the interview part two and again the script is below just incase it becomes to hard to hear.

<http://www.jumpcut.com/view?id=901E8DE074D211DB8A623EF340157CF2&type=>

Figure 14: Group Interviews links in Wiki

Week 3 reflections

Sunday 19 November 2006 by

Well I think that this week has probably been better than last. We put together our scripts for the telephone call between the Project Manager and the Client to show how we were going to elicit the requirements and also for the initial client interview to show a few of the questions we would ask as developers.

It was quite nerve wracking to sit and act out the roles. Shiv did the videoing and captured the action in various stages. He used Jumpcut to edit the video and put in titles for the three clips.



He worked so hard and the results are good. We used a study room in the LRC and I think that in retrospect we would have been better off to use an area with proper lighting. The sound quality of the video is not great so we have published the scripts along side the clips.

Figure 15: Individual group member reflections using a Blog

One Students Learning Journey

The following learner reflections illustrates one students journey of their lived experience of the group based experience as captured in the individual Blog as part of the group based assessment. This is provided to help gain further insights into the 'Net generation of learners' in terms of how learners used alternative technologies, their approaches to learning, the quality of the learning experience and the effects of such technologies in supporting group based assessment. These specific reflections were chosen as these provide 'real' depth in student reflections on their experiences which provide rich

insights into how much students gained from the experience. This is personified by the comments of LE, a business school student who was new to almost every form of technology used apart from the university MLE as this is the second year of use. LE is a good example of a student who showed real enthusiasm as well as thoughtful reflection on the learning experience. Overall this group rated the learning experience positive with an attitude rating of 9/10.

What alternative technologies were used?

The learners in this group chose to use some of the facilities provided by the university MLE including the group area, and the discussion forum. In addition to, Web 2.0 technologies: Wiki, Jumpcut, and Blogs this group used Microsoft Messenger (MSN) which was not provided in this study.

What Methods were used?

This group of learners decided to video a telephone interview between the project manager and the client and then another interview with all members of the group taking their roles. *“The phone interview was designed to allow us as a group in a scenario created by Liz, [to] actually find out what the required system needs to do”* .

Learner Views on Using Technologies

The following comments relate to learner experiences and views of using the various technologies such as collaborative video editing software 'Jumpcut', the university MLE (known as StudyNet), the Wiki and other technologies used such as MSN which was not provided for this study.

"Jumpcut was very useful because it allowed us to create 3 videos and compile them into 2 videos." "I haven't really mentioned Studynet (the university MLE) but actually I use that quite a lot in this project...It's very useful to look through the coursework discussion area because you can find answers to questions you hadn't thought of asking!"

"I put up the Specifications Doc to the Wiki because it is easier to use as a collaborative document there, rather than on Studynet. We are all going to add our ideas and suggestions to it. I normally find Studynet very easy to use but in this case I must say that Wiki does win out"

"The [MSN] meeting on Thursday was useful...Anyway we went through the agenda and covered all that we set out to discuss".

“It is useful to have an agenda because it seems much easier to go off track when we are online...I wonder if the act of typing, which slows things down, doesn’t set the same kind of protocol that talking does...It might be worth seeing if setting an order of typing would produce a more directed meeting.”

What was the Quality of the Learning Experience?

On recording the interviews to undertake the core task the learner commented: “It was fun and a great way to get to know each member of the group better. This makes the group feel like a community and when it comes to items like recording interviews it is fun to act the part but also helps communication in the group itself.”

On using the Blogs the learner commented: “Anyway having looked again at our progress this week, maybe it’s not as depressing as I thought. This is another advantage of writing a [b]log, it does clarify things and it lets you focus on what has actually been achieved and what needs to be done.”

On using the Wiki the learner commented: “We were initially going to put up our research files and links into the group area as there were some worries

within the group that publishing them on the Wiki would mean that other groups who hadn't done the work would "pinch" them".

"Although I can understand the feelings behind this, it doesn't lead to an open learning environment, where we all collaborate. Being put into groups and tasked with working on the same project will tend to make people competitive and protective of their work."

What did students learn?

"Generally I think that we have found working on-line more difficult than meeting face to face, but in industry it is more and more important to be able to communicate remotely like this, especially if you work for large multi-site organisations."

"I think that we have developed as a group and learnt how to get along as well."

"This is the end of this Blog and have to go and print it up. I will spend some time over the next week thinking of things that we did well and trying to think of what we can do better next time around. I have learnt a lot from this project from using MSN to publishing items to the Wiki."

“It just goes to show that we can communicate remotely and it’s almost second nature now.”

Discussion of Findings

This study sought to investigate integrating collaborative learning using various Web 2.0 technologies in addition to, the features offered by the university MLE to support group based assessment. The results demonstrate some useful insights into using alternative technologies and insights into the experiences of the ‘Net generation of learner’ and how to support group based assessment. There was evidence in the Blogs of real depth in student reflections on their experiences with real insights into how much students gained from the experience. This is personified by the comments of the learner LE, a business school student who was new to almost every form of media used. . *“This is another advantage of writing a [b]log, it does clarify things and it lets you focus on what has actually been achieved and what needs to be done.”* There was ‘real’ evidence of “...turning experiences into learning” as defined by Boud (2001:10) and that Blogs were used by learners for their own use as a reflective learning journal helping students to reflect on their learning *“...I will spend some time over the next week thinking of things that we did well and trying to think of what we can do better next time around. I have learnt a lot from this project”*. There was evidence that individual learners created meaning and learnt from their experiences as documented in their Blogs.

Learners equally valued the opportunity to interact and work collaboratively whilst carrying out set tasks for the assessment. This is one of the most important components of any learning experience as originally described by (Dewey, 1938, Vygotsky, 1978) and more recently (Oblinger, 2005) who describes the 'Net generation of learner' and that 'interactivity' is a key component in the learning process for this type of learner. In this study, learners valued the opportunity to learn together, work together, share and discuss ideas, and to help each other. This was evident in the reflective Blogs and the 34% increase in Figure 4 when presented with the statement "Being able to edit others work will support my learning". In figure 6 and 7, it was evident learners perceived that they would learn and indeed learnt from their peers and that their peers learnt from them, 'real' social constructivism. However, there were some negative attitudes in particular figure 4 illustrates learners concerns that other students judged them harshly when using the various technologies in the online environment. The post results in figure 9 show learners were concerned that they were unsupported by other learners online as illustrated by a 19% decrease in positive responses. Moreover, there was almost a 12% decrease in learner response to the statement "In the Online Environment I will feel in Control of My Own Learning". This statement refers to all the technologies provided to support the group based assessment in this study, learner attitude show a 'perceived' lack of control over learning. However, there was no evidence of this in the individual reflective Blogs. Concerns which were highlighted in the reflections included;

finding online working more difficult than meeting face to face, and some students were concerned about publishing materials on the Wiki for others to share. This sense of 'competitiveness' is supported by work undertaken (Doolan & Barker, 2005) who describe how learners in that study were concerned about leaving posts in an online discussion for the next years cohort of students.

It is evident from the pre and post test results that once learners completed the group assessed tasks their perception of the alternative technologies had changed; there was a 13% increase in learners' positive responses as illustrated in figure 1 that the private group area provided supported learning. There was a 16% increase in learners' perceptions that "A Blog will support My Learning" as in figure 3. This was supported by the reflections in the reflective Blogs specifically, learners valued the opportunity to reflect on their achievements and to plan and look forward to work yet to be undertaken *"it does clarify things and it lets you focus on what has actually been achieved and what needs to be done"*. .

Despite some negative comments learners overall had a positive attitude to using the alternative technologies for undertaking the group based assessed tasks. The results show that the group process was indeed supported by the technologies; as learners were able to jointly co-create, share their views and ideas, connect and contribute to the group process. They were able to

review, learn from, and provide feedback on other group products in-groups and between groups i.e. video linked to Wiki contributions.

The data derived from the reflective Blogs provided evidence of the kinds of learner engagement with the different technologies and the learning process. This is an important measure of learner use of Web 2.0 social software to support collaborative working and learning and the concept of personalised learning in a system of mass Higher Education. It was also evident that learners adapted approaches and chose to use technologies and methods that were most appropriate to support their learning and 'just-in-time' to undertake their learning activities. Learners used their own resources to undertake the recording for the core task, 8 out of 10 groups used their mobile phone, with the majority of groups using MSN in addition to, the technologies provided to undertake the group based assessment.

Few groups (only 2) valued the podcasting facility on offer using this for recording and supplemented by a script in the Wiki. Half the groups (5 out of 10) in addition to, creating a video provided an additional transcript to supplement the video. Some stated problems with the sound quality, and the lighting this maybe due to the conditions under which they were recorded i.e. using mobile phones, anytime, and anyplace. However, this study provides useful insights into the needs and expectations of today's learner and how as tutors we can redesign curriculum and adapt learning and teaching practices

to accommodate the 'The Net generation' learner (Oblinger, 2005) and the 'Digital Native' (Prensky, 2001). It is evident from this study that learners embraced interactivity and collaborative learning even though as one student commented "*it was quite nerve racking to sit and act out the roles*" referring to the video recording whilst undertaking the core learning task. . Furthermore, this learner comments, "*I have learnt a lot from this project from using MSN to publishing items to the Wiki.*"

"It just goes to show that we can communicate remotely and it's almost second nature now."

Conclusion

Online social software can be used as a resource to shift the emphasis from the tutor to the student, and as a tool for collaborative learning enabling students to acquire the necessary skills for the workplace and at the same time personalise their own learning. Using web 2.0 social software technologies offer a major opportunity to personalise the student learning experience enabling learners to co-create their own learning content, knowledge, and environment social constructivism. On a personal note, this study has provided valuable insights into the individual learner experiences and group processes in a system of mass Higher Education helping me to reflect and review my teaching, learning and assessment practices whilst helping to redesign curriculum and help align learning and teaching practices with the needs and expectations of the 'Net generation of learners'.

Technologies such as Wiki, Blogs, Podcast and Jumpcut (Video) in addition to, (or integrated into), university resources i.e. MLEs, provide new learning opportunities, and they are relatively easy to set up and use. A critical success factor is the learning design much of which is the transfer and adaptation of existing good conventional teaching, learning and assessment practices.

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C.v Bridging the Gap: Adapting curriculum design and teaching practice to engage the net generation learner in an online learning community

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Abstract This paper outlines the setting up and implementation of a multi-mode assessed collaborative student learning environment at the University of Hertfordshire incorporating Wiki, Blogs, Podcasts and Jumpcut a video editing software. Learners were given a choice in selecting the most appropriate technology to complete their individual and group tasks and present these as a group linked to Wiki contributions. Qualitative and quantitative data is provided from learners own reflections of their perception of their lived experiences which were captured using a Blog as part of an individual assessed task. Results from the reflective Blogs show overall students had a positive attitude to the experience, 8 out of 10 groups used their own mobile phone, 2 groups chose to make a podcast using an mp3 recorder and a mobile phone and link this to Wiki contributions. 1 group provided a transcript of their group podcast. Learners predominately used

MSN which was not included in this study. Other findings include: the learners preferred technology for learning, learner approaches, attitude and views on using the technologies, what students learnt and the overall quality of the learning experience. These findings are presented in the context of integrating collaborative learning into online learning and providing a sense of community.

Introduction

“Online social software can be used as a resource to shift the emphasis from the tutor to the student, and as a tool for collaborative learning enabling students to acquire the necessary skills for the workplace and at the same time personalise their own learning” (Doolan, 2007: 159) in this context ‘personalisation’ is “the opportunity to choose technologies and methods that are most appropriate to support learning and just-in-time to undertake learning activities”.

It is reported that the current generation of learners in schools will reinvent the workplace and the society they live in by the way in which they use and push the boundaries of technology (Green et al, 2007). As a result of recent studies in HE focusing on the learner experiences of using ICT, new theories are emerging around the net generation learner (Oblinger, 2005) the digital native (Prensky, 2001), multi-tasking and simultaneously using the internet, books and computers (Canole et al, 2006). The common theme amongst

these theories is a learner who has grown up with technology, is connected and personally equipped with mobile phones, personal digital assistants, and wireless laptops and uses these as a tool to network with others and to support learning. These learners have been shown to embrace interactivity and collaborative learning through Wiki and Blogs which result in new personalised ways of learning and teaching strategies that are aligned with these learner styles and expectations (2006, 2007).

Socio-constructivism postulates that knowledge construction is a social process that occurs through collaboration with others. Collaborative learning has been shown to engage learners in knowledge sharing, to provide support, where learners can depend upon another, negotiate and manage their own learning needs (Tu 2004). A key concept of integrating collaborative learning into online learning is providing a sense of community. This has been defined by Tu & Corry 2002 as "...a common place where people learn through group activity to define problems affecting them, to decide upon a solution and to act to achieve the solution". There is considerable research to characterise communities (McConnell 2006; Paloff & Pratt 1999; Wenger 1998). However, there is limited research into what actually happens in online communities (McConnell 2006) and specifically within new emerging social networking technologies such as Wikis, Blogs, Podcasting and the use of Jumpcut video editing software

Therefore, the intention of this study is to gain an understanding of how learners used the social networking technologies provided in this study: Wikis, Blogs, Podcasting and Jumpcut video editing software in addition to, the University Managed Learning (MLE) to support group based assessment. In order to gain insights into learner approaches, their preferred technology, attitude and views on using the technologies, what students learnt and the overall quality of the learning experience. These issues are explored using qualitative and quantitative methods as described in this paper and discussed in the context of integrating collaborative learning into online learning and providing a sense of community.

The Setup and Implementation

The study took place over a one-year period with sixty second year learners studying an Information Systems Development course as part of an undergraduate computing programme of study. Learners were divided into groups of six which were randomly selected from a class list and provided with private group areas in a Wiki accessible only by the six group members and shared communal areas which could be accessed by the whole cohort of sixty learners. In addition, learners had access to the University MLE. In addition, to the Wiki learners had access to alternative social networking technologies: podcasting (audio), Jumpcut (video editing software), and Blogs for individual reflections on the group process. There were a total of

ten groups numbered from one to ten. The group number related to their group space in the Wiki. These learners had not undertaken a group assessment on this course of study and were generally not familiar with the members in their group prior to undertaking this study. Learners were required to work in groups of six on group and individual assessed tasks.

Blended Approach

Mac Donald (2006:2) defines blended learning as “associated with the introduction of online media into a course or programme whilst recognising merit in retaining face-to-face contact”. This approach was used in this study, with tasks provided online by the tutor to situate learning, and encourage *inter* and *intra* group working thus providing stronger feelings that educational goals were being satisfied by the learners and indeed a sense of belonging to a ‘community of learning’. The integration of collaborative learning into online learning to provide a sense of community is defined by Tu & Corry (2002) as “...a common place where people learn through group activity to define problems affecting them, to decide upon a solution and to act to achieve the solution”. The social networking technologies wherein the ‘problem identification’ task encourages peer to peer support and critical analysis of others works, was intended to support interaction and collaborations. The blended learning and collaborative approach was intended to place the emphasis on the learner. Thus with this in mind, the ‘problem identification’ task presented in this study was set to empower learners to take

responsibility and ownership of learning whilst at the same time provide opportunities for learners to scaffold by building on each others contributions *inter* and *intra* group in the Wiki and help to move learners from dependency on the tutor to independent autonomous learning and develop a 'self help' culture. In addition to, the design of the learning tasks, collaborative learning is supported, and embedded in class based practice. In this study, this includes an online simulation activity to help learners to develop skills which they transfer to the online environment, and hints, tips, prompts, comments and explanations shared during class based learning activities and set to encourage learners to problem solve together, co-construct knowledge and share whilst preparing learners for the online learning experience.

Learners were provided with five tasks the core task 'problem identification' is outlined below, and consisted of a software development task in which learners were expected to elicit and document requirements using the template provided by the tutor and related to gathering the requirements for a software development task. Based on a realistic case study using role playing as 'developers' and 'clients' in groups learners were expected to:

Choose a method: interviewing, direct observation, brainstorming or another method of your choice. Agree this on the Discussion forum on the MLE by a set date. Students were expected to state the technology they intended to use to carry out the task and if they had the resources to undertake the task.

Record using one or more of the following: video, webcam, audio, podcast, document in Wiki or capture ideas using the discussion forum, or another method of your choice.

Add the results/product in Wiki show, share work and gain feedback from “a set of potential users”. Learners were required to submit their product in the communal area in Wiki and gain feedback from another group.

Use feedback obtained from the group to complete the ‘Requirements Document Template’ provided to document the requirements.

The overall learning objective is to apply the principles and techniques of system development in a team environment, thus fostering and developing collaborative working skills. This requires learners to move from problem identification through to implementation and evaluation therefore, the ‘core task’ problem identification: requirements elicitation and documentation phase is crucial in the software development process with all other tasks built on this. Each of the ten learner groups were required to complete a report as part of their assessment,

In performing the tasks, a range of communication, information gathering and role play activities were employed. Full assignment specification was provided by the tutor as a script in Wiki and through audio and video in addition to, assessment criteria and templates which were made available to

learners in the communal space on Wiki and a summary was presented in a lecture. Learners were made aware that all tasks were to be assessed after the final submission deadline and were provided with two lectures on group work. An introduction to using the technologies took place through a live demonstration in a lecture when distributing the summary assignment specification.

The tasks were distributed by the tutor in different formats: video, podcast and script linked to Wiki contributions, and integrated with class based teaching practices. The tutor provided the core task in audio and video by recording the task using a webcam. The audio was extracted from the video using Adobe Audition. Both the audio and video files produced were embedded in the Wiki and linked to Wiki contributions. These recordings were 'not polished' as these were provided to deliver the assessed tasks and furthermore, as an illustration of the possibilities whilst using the various social networking technologies. 'Authenticity of tutor voice' was maintained by providing the tutors own 'unpolished' voice and intended to simulate the tutor voice as would be heard in a lecture. In addition the various formats were intended to provide learners with choice on how, when and where they received the task instruction. In addition to the Wiki the alternative social networking technologies were intended to provide learners with opportunities to engage with each other and their learning, whilst working and relating to each other outside the classroom.

Method

Qualitative and quantitative data was derived from the ten groups of six learners who were required to complete Blogs as an individual assessed task. The reflections were based on specific topics raised in the Blogs, open in their nature and guided by questions specifically designed to encourage learners to reflect upon and evaluate their own experiences. To obtain in-depth insights into the perception of the single learner experience, case narratives are used (Denzin Lincoln, 2005). Using purposive sampling (Silverman, 2000) three individual Blogs were selected and representative of a high, mid and low mark awarded to learners for the group report. Each case is presented using a fictitious student name, mark awarded, attitude rating and as a summary of the learners' perception based on questions in the individual reflective Blogs of their experiences with the technologies. To measure attitude individual learners were required to provide an attitudinal measure using a Lickert scale where 1 represented poor, 5 average and 10 an excellent learning experience.

Content Analysis (Robson, 2002) is used to gain insights into the students own lived experiences by studying the individual student reflective Blogs. These were analysed and coded based on Hosti (1969) in Krippendorff (2004: 100) recording a unit of text as "the specific segment of content that is characterised by placing it in a given category". The analysis process was

undertaken manually by reading and re-reading the student reflections, whilst highlighting and colour coding the categories.

Results from Reflective Blogs

Results show 8 out of 10 groups used their own mobile phone to record video and podcasts to complete the core task for the group based assessment and linked these to Wiki contributions.

Some groups chose to carry out an interview and brainstorm to undertake the core task and record this using mobile phones and mp3 recorders. 5 out of 10 groups transcribed the process and attached this script to the Wiki page to share with the cohort. As illustrated in figure 1 this group decided to edit the video using the Jumpcut video editing software and stored the video on the Jumpcut server. The learners then created a link to the video and placed this on the communal area in Wiki to obtain feedback from another group. A different group of learners composed the feedback on a Wiki page and created a link in the communal area in Wiki to share with the group who completed the work; and open to other groups. This feedback was then used by the group and incorporated into the Requirements Document template provided by the tutor and included in the group assessed report.

Group 9 Interview/Brainstorm

The following link shows the recording by a team of Software System Developers (Group9) who use a combination of an interview and brainstorm to capture the requirements of a small system named 'Little Horrors Child Minding Agency'.

Below is the link to our recording which we did using mobile phones. We then used jumpcut to add a few extras, and as a place for it to be viewed.

<http://www.jumpcut.com/view?id=7CC84AAC78A511DB8AD23EF340157CF2>

Below is a link to see exactly what was said during the Interview/brainstorm if the recording can't be heard.

Go to the following link to see the script: [Script](#)

Figure 1: Group Wiki Contribution

Figure 2 below illustrate the research undertaken by this group prior to undertaking the core task and shared in the communal resources area in Wiki.

Group Nine

The research began by looking for information and examples of good HCI. We think that this will help us in creating a system relative to the users needs. We found a good site <http://www.dfki.de/~jameson/hci/> check out the PDF files which take you through the processes of ensuring good HCI.

We then wanted to find a similar business to that of the case study to compare our original thoughts to a completed system. However we were cautious as we felt that we needed to find not only a similar business but one of a similar size. We found <http://www.bestbear.co.uk/about.htm> we thought that this site was relevant to the task as although it is only for hiring child-minders we felt that it was a good example. It could also be developed further if the business grew to offer more services.

As part of my role as System Analysis I did some research into the position itself I found a useful website below which highlighted a lot of important roles I didn't know before. http://pespmc1.vub.ac.be/ASC/SYSTEM_ANALY.html

The following site shows many useful points of the role of Business Analysis in a bullet point view. http://www.siliconbeachtraining.co.uk/systems_analysis_design_training/business_analysis

Figure 2: Shared resources *intra* groups in Wiki

The following two learner reflections illustrates the learners lived experience of the group based experience as captured in the individual Blog as part of the group based assessment. These are provided to gain in-depth insights into the 'Net generation of learners' in terms of how learners used alternative technologies, learning approaches, the quality of the learning experience, attitude and the effects of such technologies in supporting group based assessment.

This is personified by the comments of Jack, a business student who was awarded the lowest mark in the group, 49%. His comments were the strongest contrast to those who had a positive experience, highlighting some of the negative feelings online working can elicit. Overall Jack found the experience of using the alternative technologies something of a strain. However, Jack did recognise the potential for using Blogs, Wikis, and MSN to support the group based assessment. In particular the flexibility offered by such technologies, when they the group was faced with timetabling difficulties.

In contrast, Henry a business student obtained 39% the highest mark in the lowest performing group and found the experience positive awarding an attitudinal rating 7/10. Henry demonstrates a good grasp of the learning outcomes of completing a group based assessment using the technologies. Henry also showed some creative flare conveyed in a photographic collage of his experiences.

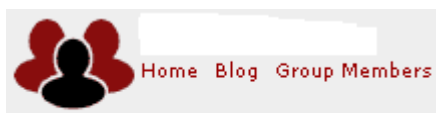
Case 1: Jack

This group used Wiki, Blogs and podcasts in addition to, MSN which they used for online meetings. Jack found the online MSN meetings a difficult experience and had mixed views on using the technologies used.

What Approaches were used?

This group decided to record a podcast of an interview between the client and developers using a microphone and PC. They booked a room in the Learning Resources Centre and hired a microphone. There were some difficulties using this method and a fellow student came to the rescue by loaning the group his own digital voice recorder.

On the whole this group seemed to find the experience of recording the podcast rather problematic. They were able to successfully record their interview but transferring the file from digital recorder to PC was time consuming. Jack reflected on the experience illustrated in figure 1 below:



Group Blog

Group 7 used podcast as our method of capture. I think this was interesting of the group as pod casting is rife in the world we live. Ricky Gervais' podcasts were some of the funniest things I have heard and I am often guilty of looking at podcasts for my favourite tv programs or even sporting events. This brings the technology into our domain and gave us enthusiasm we needed to embrace it. I think basically from my own experience none of us particularly wished to be filmed and this was a major determinant of the medium we used. Often in the 'real' world people are unwilling to be filmed doing quite normal things without a character to play.

Figure 3: Podcasts: Making real world links using the Blog

What was the quality of the learning experience?

“The group have met over MSN and face to face where we have discussed the project ...MSN is not really my favourite pastime so I found this a little hectic at first and would certainly not like to have used it too often as a means of meeting up with groups of people.”

“Wiki has been the area for the group to leave and work and pick it up again. I found the blank setup of the pages both positive allowing us to create a format which we found acceptable. However this was simultaneously a problem for me as I like structure.”

“The Blog was interesting because I’ve never done one before. But I felt instead of writing what I thought of people I would rather say it to their face, I felt like I was talking behind peoples backs in a way.”

What did they learn?

“The group assignment itself taught me to work with individuals I’ve never met and I think the results are very positive, its very easy to slack off when your working for yourself, but when your concerned about other peoples grades as well as yours you seem to want to work a little harder”.

Overall, within the group fluctuating levels of commitment raised many issues and on the whole the group did not have the sense of community that other groups achieved. Although, later reflections as in figure 2 indicates a learning community. Jack reflects;

“I am disappointed with my own effort ... For example the Blog is in effect an easy piece of work in principle, but I have neglected it due to my uneasy feelings towards the whole process of reflection.”

“The use of MSN is not an area I particularly enjoy ... I am hugely aware of what you can miss in these environments in the form of body language.

These important aspects of communication are not even close to being represented by 'Emoticons'. I seriously detest these little smile faces or winks etc.”



Group Blog

The learning community was created and marshalled essentially by ourselves. By posting I felt a part of that and feel that my posts were relevant and this is what makes us able to say we participated and felt like a piece of the jig saw.

Figure 4: Jacks reflections in the Blog on learning community

Case 2: Henry

For the task of identifying user needs this group planned to use a two stage process using an informal brainstorming session and a more formal interview using a story-line. The group showed a good understanding of the limitations of each method.

This group used Wiki, Blogs, mobile phones and MSN. Henry also used a photographic collage of the week by week group meetings. The group used Jumpcut to edit the recordings they made. It was regarded as a good tool that promoted the groups creativity and enabled them to make the most of

what proved to be a rather poor recording by the mobile phone. Using Jumpcut the group was able to produce a more polished, professional looking end product.

What Approaches were used?

They chose a digital camera to capture the process. When the camera proved problematic they switched to recording using a mobile phone. Henry reflects;

“... we have finished our recording this afternoon. It went well in the end but started disastrously. We decided to capture the clients requirements by recording with a camera and using a brainstorm, the first recording went extremely well and we thought we had captured all the requirements really well. However, the first recording did not record and so we had to start over. The second recording recorded only three-quarters of the meeting and this became quite frustrating as we felt that both recordings were really good. The third recording we decided to use a phone which recorded us without problems. I need to double check it but hopefully it all works now third time lucky!!!!!!”-

What was the quality of the learning experience?

The reflective Blog indicated that overall the students felt the whole experience of making the recording was positive and enjoyable. Henry reflects;

“I think the group began to bond best when we did the recordings as I have stated in my Blog it took us three attempts before we finished and this took us through until very late in the evening. We had all had lectures all day and instead of getting angry we all had a laugh about it which I thought was good as we were all committed to getting the recording done well”

The Blog also proved to be a good reflective process, allowing the student to assess their progress and offering a good incentive to complete tasks on time. Henry reflects;

“The Blog provided me with an insight into my own progress, it enabled me to look back a week and realise if we had progressed as planned and completed tasks we set”

I also started on my Blog in week two. I was a little disappointed towards the end as I realized I had done the Blog wrong. Instead of adding a new entry every week I edited what I already had add in my weeks week by week”.

On using Jumpcut Henry reflects;

“I personally found the Jumpcut process a superb means of creative learning and really enjoyed it”

“We found Jumpcut a really useful tool which allowed us to further develop our knowledge of completing work using an array of different techniques... We thought Jumpcut allowed us to improve what we had recorded it helped us in putting some important finishing touches. Many of us never knew Jumpcut existed and I think it will help to improve our creativity with future projects.”

Overall this group agreed that a combination of new technologies suited them and were useful tools for the continual exchange of ideas between group members with timetables that did not always allow face-to-face meetings with all members.

What did they learn?

Overall the group learnt the importance of good communication between members of what was a fairly large group of people who had not worked together before. Henry reflects;

“I think that having used these tools now it has given me an insight to the importance of communication between people who are working together on a project, and really how essential it is.”

It also provided the group with some insight into the value of experience using these tools and methods in a commercial environment. Henry reflects;

“I can really understand why so many companies would want these tools available to their staff. I believe it to be a real asset to anybody who needs to communicate with people fast and regularly.”

Furthermore students commented on the sense of community they had between group members and with other groups on the course through using the Wiki. Henry reflects;

“I think that the Wiki helped us not only as a group to communicate but to show us a different concept of working together. I think that throughout the project I felt part of a community.”

“As a group we used the Wiki to help us communicate with one another. We also used it to communicate with other groups to offer advice and feedback.”

Discussion of Findings

This study sought to gain an understanding of how learners used the social networking technologies provided on their course: Wikis, Blogs, Podcasting and Jumpcut video editing software in addition to, the University Managed Learning (MLE) to support group based assessment. In order to gain insights into learner approaches, their preferred technology and views on using the technologies, what students learnt and the overall quality of the learning experience.

Interestingly, almost all student groups owned and used their own mobile phones to support their learning. Similarly, Altree & Quadri (2007) in their study reported that of the 2143 students surveyed at the University of Hertfordshire 92% had mobile phones. However; the results may be different if students used their own resources and were required to pay. Of the 2 groups who podcasted 1 experienced problems as conveyed by Jack when attempting to use the university borrowed equipment and uploading the file.

Overall learners in this study demonstrated that working together and using the technologies they communicated with each other, held meetings online, and the group assignment itself taught them to work with individuals *inter* and

intragroups. This is one of the most important components of any learning experience as originally described by (Dewey, 1938, Vygotsky, 1978) and more recently (Oblinger, 2005) who describes that 'interactivity' is a key component in the learning process of the 'Net generation of learner' Learners showed concern for others "...when your concerned about other peoples grades as well as yours you seem to want to work a little harder". Some learners felt they developed a bond with other group members whilst undertaking the role play and using their mobile phone for recording "*I think the group began to bond best when we did the recordings...*" However, at least one member of the group Jack found meeting online problematic particularly using MSN which was not provided in this study "*MSN is not really my favorite pastime... a little hectic ...not like to have used it too often as a means of meeting up with groups of people.*" Overall groups developed a 'sense of community' as described by Tu & Corry (2002) and evidence of collaborative learning as described by Tu (2004). Henrys group did so *inter* and *intra* groups through using the Wiki.

There was 'real' evidence of "...turning experiences into learning" as defined by Boud (2001:10) and that Blogs were used by learners for their own use as a reflective learning journal helping students to reflect on their learning. "*We found Jumpcut a really useful tool which allowed us to...develop our knowledge... using an array of different techniques... We thought Jumpcut allowed us to improve... Many of us never new Jumpcut existed and I think it will help to improve our creativity with future projects.*" Despite some concerns highlighted by Jack on keeping reflections, he demonstrates

“...turning experiences into learning” in his reflections. *“I am disappointed with my own effort ... For example the Blog is in effect an easy piece of work in principle, but I have neglected it due to my uneasy feelings towards the whole process of reflection.”*

Overall groups valued the flexible opportunities afforded by the technologies and agreed that a combination of new technologies suited them and were useful tools for the continual exchange of ideas between group members with timetables that did not always allow face-to-face meetings with all members.

Conclusion

This study provides useful insights into the needs and expectations of today’s learner and how as tutors we can redesign curriculum and adapt learning and teaching practices to accommodate the ‘The Net generation’ learner’ and nurture ‘a sense of community’.

This study forms part of a wider study; the broader contribution will be guidelines to help in the development of capability and capacity in online community building in a response to the Higher Education and Funding Council (HEFCE, 2005) 10 year e-learning strategy to help HE institutions to ‘embed’ e-learning into all aspects of teaching and learning, and the planned implementation of the Department for Education and Skills (DfES, 2005) e-

strategy, with a focus on 'personalised learning' through the 'harnessing' of new technologies.

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Biography

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C.vi Making the Tacit Explicit: Developing A Pedagogy Using Web 2.0 To Engage The Net Generation Learner

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Abstract

This paper shares a tutors approach to exploiting the pedagogic potential of social networking technologies such as Blogs, podcast and video embedded in a Wiki with 60 campus based learners. The tutor role was front-loaded providing detailed instruction, learning activities, templates, resources and materials for learning, thus enabling learners to engage with each other *inter* and *intra* group without tutor intervention. Learners were prepared for the online experience in class using a variety of learning approaches including an online simulation activity.

Through a practical example of implementing Wiki, video, and podcasts this paper examines how social networking technologies can be used as part of a social constructivist pedagogical practice to guide learners to undertake group work in the context of learning groups.

The pedagogic model developed is explored and includes the course design, type of 'blend', such as the mix of online and face-to-face, student preparation and the use by the tutor of freely available web 2.0 tools to record and edit the video and audio.

Evidence of the impact of the role of the tutor on the learning experience was measured using a pre and post test questionnaire. 44 (73%) responded to both the pre and the post test questionnaire and a Wilcoxon Signed-Rank test was performed to determine whether there was a significance difference between the responses.

Results show a less positive attitude by learners to working in group assignments following the experience $z = -3.81$ $N = 44$ $p = 0.0001$, a more positive attitude that the tutorial activities set by the tutor provided sufficient knowledge to undertake the group work $z = -2.21$ $N = 44$ $p = 0.03$, there was no change in attitude towards the tutor choosing group members $z = 0.69$ $N = 44$ $p = 0.49$, learners showed a more positive attitude that the learning materials set helped to feel a sense ownership of group work $z = -2.56$ $N = 44$ $p = 0.01$. Finally, the results show a more positive attitude towards the online learning activities which were designed to prepare learners for the group experience $z = -2.21$ $N = 44$ $p = 0.03$

Keywords: Pedagogy, Collaborative Learning, Social Networking, Net Generation, Social Constructivism

Introduction

The rapid pace of the emergence of social networking technologies raises a number of pedagogic challenges and opportunities for academics and staff developers. If we are to meet the expectations of the net generation learner it is important for practitioners to be provided with opportunities to continuously update themselves with the increasing possibilities that these technologies afford in the education sector, and their potential to enhance knowledge development and transfer. As a result of recent studies in Higher Education focusing on the learner experiences of using ICT, new theories are emerging around the net generation learner [1], the digital native [2], multi-tasking and simultaneously using the internet, books and computers [3]. The common theme amongst these studies is a learner who has grown up with technology is connected and personally equipped with mobile phones, personal digital assistants, and wireless laptops and uses these as a tool to network with others and to support learning. These learners have been shown to embrace interactivity and collaborative learning through Wiki and Blogs, for example, which result in new personalised ways of learning and teaching strategies that are aligned with these modes of learning, and learner expectations [4], [5]. Collaborative learning has been shown to engage learners in knowledge sharing, to provide support, where learners can depend upon one another, negotiate and manage their learning needs [6], [7].

Therefore, this paper describes how social networking technologies can be used as part of a social constructivist pedagogical practice in Higher Education to guide learners to undertake group based assessment in the

context of learner groups. The approach adopted is to blend face to face and online learning experiences, ensuring learners feel fully supported, motivated, and engaged in their own learning. This is based on practice and lessons learnt by a tutor in the School of Computer Science at the University of Hertfordshire in the United Kingdom.

This paper is intended to support other practitioners in helping to meet the pedagogic challenges and opportunities using group based assessment to engage learners in social networking technologies such as Wiki, video, and audio.

Setting The Culture – Teaching Philosophy

“Assessment which is the servant rather than the master of the educational process will necessarily be viewed as an integral part of teaching and the practice of improving teaching” [8].

To this end, the role of the tutor is to understand the processes of student learning through continuous dialogue with learners [9]. The tutor style is interactive, and learners are expected to interact and engage in their learning. Learners are encouraged to actively contribute in class and are reassured that what they say matters. The tutor creates a relaxed atmosphere [8] where the participants are at ease to feel frightened and to express this. The tutors’ role is motivating and supporting learners to become

autonomous learners away from tutor dependency. To this end, learners are stimulated by encouraging them to adopt an open and inquisitive approach to their learning and intellectual development a skill which they can use throughout their lives.

As a Blended Learning Fellow with the institutional Blended Learning Unit; a Centre of Excellence in Teaching and Learning (CETL) practice is underpinned by the seven principles of good practice in undergraduate education [10] as outlined below:

Principle Good Practice

...encourages contact between learners and faculty

...develops reciprocity and cooperation among learners

...uses active learning techniques

...gives prompt feedback

...emphasises time on task

...communicates high expectations

...respects diverse talents and ways of learning

Central to this, is the need for individual learners to feel supported, safe and sheltered, where learners support each other as they build their own learning

community with high levels of motivation and engagement. To help with this, the tutor communicates high expectations, develops reciprocity and cooperation amongst learners whilst in class. The tutor also fosters respect for each other and encourages learners to acknowledge the range of abilities, styles, and diversity in learning. The tutor communicates responsibility to learners as their tutor, and learners are encouraged to communicate theirs to the tutor, and each other. These engagement protocols aim to help learners to take responsibility for themselves, and their own learning, whilst being sensitive to the needs of others in their group. The tutor is not only keen to encourage active learning amongst learners, moreover, to nudge learners to take ownership of their learning; the ethos is one of being in a sheltered and safe learning environment, one that is motivating and engaging. The tutor is especially interested in furthering learners use of social networking technologies in their studies by tapping into what they already know, and use recreationally [3]. This taps into their already existing skills and knowledge base, nurtures motivation, and sets the student on the path to discovery, whilst providing an opportunity for them to engage with and develop transferable skills such as collaborative working and team building [5], [7].

The underlying teaching philosophy is a blended social constructivist approach; the blended approach combines technologies outside of the classroom with face-to-face class-based activities [11]. The social constructivist approach engages learners' collectively to share knowledge and skills through assessed individual and group based learning activities. This approach can provide an opportunity to develop authentic situated

learning; authentic meaning “real life” experiences, situated in contexts and situations which would normally require that knowledge through social development. The tutor sets “real world” problems that need solving in groups to evoke student motivation as described using the tasks presented in this paper. The tutor then uses social networking technologies to help shift the emphasis from the tutor to the student.

The social constructivist perspective is supported by social networking technologies wherein activities set encourage peer to peer support and critical analysis of others works, supporting interaction and collaborations as described in this paper. This social constructivist environment places the emphasis on the learner.

The Course

The course was undertaken by sixty second year undergraduate learners studying on a combined modular degree programme, and is built around information systems case studies to provide learners with an insight into realistic company environments. The overall aim of the Information Systems Development course is for learners to develop their skill in all stages of developing computer-based, user-friendly information systems. The case study was based on a child minding agency, which required a computer system to replace the current paper based system. The case study was as ‘realistic’ as possible providing the learners with an opportunity to role-play the client and developers whilst building a computer system. Learners were

required to carry out thorough analyses and design for this computer system. Learners were also expected to use appropriate engineering practices to make informed decisions about best approaches to an information system development, from problem identification to implementation and evaluation, and pursue the chosen approaches within the context of a collaborative working environment. Learners were required to apply the principles and techniques of system development in a team environment, thus fostering and developing collaborative working skills while acquiring practical experience in the application and evaluation of techniques for development.

For the group based assessment learners were required to work in groups of six on group and individual assessed activities. Active learner engagement requires the chosen activities to be shared equally within and across the group [4] enabling personalised learning and autonomy [12]. Therefore, the learners were divided into groups of six which were randomly selected from a class list and provided with group areas in Wiki in addition to, shared communal areas by the whole cohort of sixty learners. Learners also had access (in addition to, Wiki) to alternative Web 2.0 social software including podcasting (audio), Jumpcut (video editing software), and Blogs for individual reflections on the group process. Learners were actively encouraged through the learning activities to co-create content, to share this content in terms of products produced and reflect on the experiences using a Blog as part of the assessed tasks.

Learning Activities

The learning activities were designed to ensure that learners were empowered to take responsibility, and ownership of learning whilst at the same time provided opportunities for learners to scaffold. The learning activities were provided by the tutor in the following formats: video, audio and script and these were made available in the communal area in the Wiki in addition to, an overview delivered in a lecture. Figure 1 provides guidance for students when submitting learning activity 2 to the Wiki and an illustration of tutor contributions provided in the form of a video and a podcast. The video was recorded by the tutor using a webcam, after which technical support staff used Adobe Audition to extract the sound file to create the podcast for learners. The video as shown in figure 2 was then edited by the tutor using freely available web 2.0 software Jumpcut. Learners were required to ensure that all learning activities were clearly visible in either their group area or the communal area in the Wiki dependent on whether the task was *inter* or *intra* group.

Requirements

Post the results of your recording of your chosen method here (below the Group Tutor example) you may create a page off this page, simply link to your work on this page or add an attachment. What is important is your work runs, it is clearly visible, ensure that you include you group number on your work see the example below.

An example created by (GroupTutor)

An illustration of recording using a podcast is attached to this page see below. You may open this in a media player for example itunes or download this to an mp3 player.

An illustration of a recording of the method: direct observation using the device: an audio webcam to record and edited using Jumpcut is here, this video is streamed so press play after the status bar has completed otherwise the recording will appear broken

<http://www.jumpcut.com/view?id=098464E8644D11DBB081A6B200DB926D&type=movie>

Figure 1: Tutor contribution in Wiki



Figure 2: A tutor video recording as posted on the Wiki

Based on a case study learners were expected to carry out the following learning activities:

Activity 1 (Individual) – Group Commitment

Submit the following to your private group area in Wiki (Inter group activity)

1. Submit your individual name and the names of other group members, e.g. I am Fred Bloggs and I am working with John Smith, Mary O' Reilly and Peter O' Connor. I am Peter O' Connor and I am working with Fred Bloggs, Mary O' Reilly and John Smith etc.
2. Confirm that you have: A list of group contact details (names, telephone numbers, email addresses).
3. Identify the 'ground rules' the group is using in order to be able to operate successfully
4. Organised group meetings; this must include dates and times of planned meetings.
5. All meetings must be take place on-line and are to be documented using the format:
6. Apologies for absence, Minutes of last meeting, Motions (list of matters discussed), Special Reports (if any), and any other business. Actions identified at meetings MUST name the person(s) responsible for carrying out these actions. Each individual student is responsible for

signing and agreeing to these at every meeting. (The signed copies must be included in the paper version of your group report). Each individual student is responsible for demonstrating in their individual reflective log (see Activity 5) how they have met their agreed group commitment.

Activity 2 (Group) - Identify Users Needs and Establish Requirements

Submit the following to your communal group area in Wiki (*Intra* group activity)

To capture requirements you will need to:

1. Study the case study provided
2. Research using the web
3. Add the results of your research on the ResourcesForLearning/Research page in Wiki and make sure to follow the instructions on how to do this very carefully. Instructions and an illustration of how to do this can be found on the ResourcesForLearning/Research page in Wiki.
4. Choose one of the following methods: interviewing, direct observation, brainstorming or another method of your choice.
5. Record this process using one or more of the following: video, podcast, webcam, module class discussion, collaborative document or another method of your choice.

6. Add the results of your recording of your chosen method on the ResourcesForLearning/Requirements page in Wiki and make sure to follow the instructions on how to do this very carefully. An example of using a podcast and a recording using a web cam as a device is provided on the ResourcesForLearning/Requirements page in Wiki.to help with this.
7. Complete the Requirements Document Template provided on the ResourcesForLearning/Templates page in Wiki.

Ensure that this section is clearly visible in Wiki

- a) Capture requirements following the steps above: You are required to identify user's needs for the "little shop of horrors child minding agency". Record your data using the requirements template provided in the learning resources area on Wiki.
- b)** Make sure the method chosen i.e. interviewing, direct observation, or brainstorming has been recorded using the appropriate device; for example, audio or visual podcast, video or webcam recording, module class discussion, collaborative document in Wiki or another method/device of your choice. Show it to a set of potential users and get some informal feedback.[use another ISD2 student group NOT in your assessment group]. This process must be made available via a link at this location in Wiki: ResourcesForLearning/Requirements. You must also provide a link to this in your private group space in Wiki and ensure it is visible with text which clearly explains this for the tutor.

Each group must ensure that their group number and the group number of the group evaluating their product is clearly visible on Wiki.

- c) Based on your user requirements, choose two different user profiles and produce one main scenario for each one, capturing how the user is expected to interact with the system. The process and the outcome must be clearly documented in your private group area in Wiki.

Activity 3 (Group) - Develop Storyboard, and Detailed Design

Ensure that this section is clearly visible in Wiki in your private group area (*Inter group activity*).

1. Produce a storyboard based on requirements and user needs identified in Activity 2 (a).
2. Show it to a set of potential users [using the roles provided on the “Roles” handout role play within your student group in Wiki] and get some informal feedback.
3. Sketch out the application’s main screen (home page). Consider the screen layout, use of colour, navigation, audio, animation, etc. While doing this consider: Where am I? What’s here? Where can I go? Write one or two sentences explaining each of your choices, how these choices will affect the users, in particular Diresh, and consider whether the choice is a usability consideration or a user experience consideration.”

Activity 4 (Group) Develop a current physical dataflow diagram

Ensure that this section is clearly visible in Wiki in your private group area (Inter group activity).

Draw a current physical data flow diagram using Britton & Doake notation (in the course text book) which clearly labels the input and output flows, and shows the system boundary.

State any assumptions you have made, and document at least two questions that you have asked during your requirements capture (Activity 2 above).

Using your own words in one sentence state how the Data flow diagram relates to requirements.

Activity 5 (Individual) – A reflection on Activity 1 and 2

Using your Blog on the University Managed Learning Environment each individual group member is required to keep a week by week reflective log of the process undertaken to complete this assignment this is to help you reflect upon your experiences under the headings provided. This forms part of the final group report submission. You may use pictures, sound etc. to describe your experiences. This Blog should not exceed 10 pages of A4, must NOT be made visible to the group before the submission date, this Blog will be accessible online by your tutor and must include evidence to support your

reflections you may use screen shots in Wiki and/or the other technologies provided/used. It may help to define categories in your Blog using the heading provided.

In your reflective Blog write a paragraph describing the usefulness or otherwise of keeping this weekly Blog and of posting reactions to the week's use of Wiki, the alternative technologies, reflections on group assignment and the group process.

The intention of activity 5 was to help gain insights into the learning process in a system of mass Higher Education in an attempt to gain insights in the three main key areas of interest: Learning, Technology, and the Tutor.

Preparing Learners

Learners were prepared for the online experience during tutorials. A tutorial group consists of thirty learners; generally activities during tutorials are conducted in groups of usually six members. On a weekly basis where possible students work in different groups in an attempt to share different knowledge and understanding of material. The material was delivered in lectures which were directly followed by tutorials. The tutorials were intended to encourage students to actively engage in learning activities whilst in the context of learning groups. The introductory class-based activities set by the

tutor engaged students in simulated on-line activities, providing hints, tips, prompts, comments, explanations and prepare them for the individual, and group online assessed activities and tasks. The activities were set to encourage group members to actively share knowledge, and critical understanding of concepts, and methods delivered during the lectures. Often, this required practical application of methods delivered; demonstrating a level and ability in analysis and evaluation whilst demonstrating an ability to work and relate to others in a team environment, crucial for learners studying the Information Systems Development course. To ensure learners were adequately briefed, and understood the requirements of the assessed learning activities, the online Wiki environment was introduced through a live demonstration in class. In this way feedback from students was used to address potential problems. An online simulation exercise provided learners with the next preparatory stage, moving from the familiar face to face tutorial and leading them into an online collaborative environment through a simulated interactive exercise. This involved providing students with a group based problem to solve, using a large piece of paper to replicate an online Wiki page, some post-it notes, a pen and instructions not to talk as they completed the exercise, thus simulating an online asynchronous environment. Learners wrote on the post-it notes and attached these to the large piece of paper, thus simulating contributions to a Wiki page. After this simulation task learners were encouraged to talk, and share their experiences, and to compare the advantages, and disadvantages of working online compared with face to face classroom based task. This helped

students to plan and contextualise how they intended to work in the online Wiki environment to support their group based assessment. It was also important to emphasise the need for team working skills given this was a learning objective on the course, this was achieved by providing learners with an article highlighting the need for these skills in the workplace. Once learners felt adequately prepared, a discussion forum was used to extend the class based dialogue and tasks. On a weekly basis leading up to the group based assessment activities learners were encouraged to contribute to the discussion forum which was housed on the university managed learning environment. This helped students to engage in an online asynchronous environment which was structured requiring posting, and responding to the tutor and other students building on the class online simulation exercise. This helped further prepare learners for the dynamic Wiki environment with no fixed structure. The Wiki provided learners with pages that could be constructed and authored to best suit their needs in undertaking the group based assessment activities. Wikis provided an opportunity for learners to network pages, and so pages may be linked to other pages and/or linked to other websites and content, including images, sound, video, Word documents and Powerpoint presentations creating opportunities for a “truly” dynamic learning environment which shifts the emphasis from the tutor to the learner. The approach is co-constructural one that sees the tutor less as an expert and more of a supporter of learning.

Data Gathering

Quantitative data came from a pre and post test questionnaire which was undertaken one week prior to the start of the study and one week after completion of the study in an attempt to measure the learner attitude and impact of the tutor role. 44 (73%) responded to both the pre and the post test questionnaire and a Wilcoxon Signed-Rank test was performed to determine whether there was a significance difference between the responses.

The questionnaire was distributed during a taught lecture using an EDPAC answer sheet and results were fed through an optical mark reader. The questionnaire was designed using a Lickert type response 'A' to 'E'. Where 'A' indicates 'Strongly Agree', 'B' indicates 'Agree', 'C' indicates 'No View', 'D' indicates 'Disagree' and 'E' indicates 'Strongly Disagree'.

Results And Discussion

Qualitative Data Analysis - Pre and Post test Questionnaire

The results are shown in figures 1-5 below. 'SA' indicates 'Strongly Agree', 'A' indicates 'Agree' and classed as 'Positive Responses' 'SD' indicates 'Strongly Disagree' and 'D' indicates 'Disagree' and classed as 'Negative Responses'.

Results show a less positive attitude by learners to working in group assignments following the group work experience $z = -3.81$ $N = 44$ $p = 0.0001$ as illustrated in Figure 1.

Figure 3: I feel happy to work in group assignments

As with traditional group based assessment problems arise, learners undertaking group based assessment using the social networking technologies expressed an unhappiness to work in group assignments, it is apparent that similar problems arise whether technology is utilised to support group based assessment or not. Students expressed concerns through their reflective Blogs finding online working more difficult than meeting face to face, and some students were concerned about publishing materials on the Wiki for others to share [5]. These findings are supported [14] who describe how learners were reluctant to leave postings in a discussion forum for the next years cohort intake.

Results indicate a more positive attitude following the group work experience that the tutorial activities provided during the preparatory stage such as the online simulated activity set by the tutor and undertaken by learner groups during tutorials prior to the group work experience provided sufficient knowledge to undertake the group work $z = -2.21$ $N = 44$ $p = 0.03$ as illustrated in figure 2.

Figure 4: The tutorial Activities

The introductory class-based activities were set by the tutor to engage students in simulated on-line activities, providing hints, tips, prompts,

comments, and explanations to prepare students for the individual and group online assessed activities and tasks. Findings suggest that the students felt adequately prepared by the tutor to work in the online Wiki environment to support their group based assessment. Results of the a Wilcoxon Signed-Rank test show no change in attitude towards the tutor choosing group members $z = 0.69$ $N = 44$ $p = 0.49$ however, as shown in figure 3 there was a shift in learner attitude highlighting that learners were happy for the tutor to choose group members, in this study the tutor chose group members randomly from a class list and learners were informed of this, this meant that learners did not necessarily know each other as group members were chosen from across the cohort of sixty learners studying the Information Systems Development course demonstrating that students do not always wish to chose their own groups, indeed be working in friendship groups.

Figure 5: Choosing group members

Results from the Wilcoxon signed test show learners with a more positive attitude that the learning activities set helped them to feel a sense ownership of group work $z = -2.56$ $N = 44$ $p = 0.01$. This refers to the five individual and group based tasks provided by the tutor for students to undertake within their group of six (inter) and across groups (intra) using the social networking technologies provided such as Wiki, Blogs, video (Jumpcut) and audio (Podcast). These results are in keeping with the tutor teaching philosophy empowering students to take responsibility and ownership of learning helping

to build on each other's knowledge and skill base in addition to the taught and assessed material provided.

Figure 6: Ownership and group work

Finally, the results show a more positive attitude towards the online learning activities which were designed to prepare students for the group experience $z = -2.21$ $N = 44$ $p = 0.03$. These activities formed part of the preparatory stage designed by the tutor to prepare learners for the online social networking experience.

Figure 7: Using the Class Discussion in preparing students for group work

The discussion forum was used to extend the class based dialogue and tasks. On a weekly basis tasks were provided on the class discussion by the tutor and set to encourage learners to seek, find, share, work and relate with each other. The concept of students as a valuable learning resource was utilised. The tutor was available to respond to postings twice weekly and postings contributed by learners were discussed during the preceding tutorial sessions, this appeared to encourage students to contribute further postings, enabling the tutor to step back over time. This seems to have helped

students prepare for the group work and the co-constructive approach using Wiki one that sees the tutor less as an expert and more of a supporter of learning by preparing the students for the online social networking learning experience to support group based assessment.

Conclusion

Online social software can be used as a resource to shift the emphasis from the tutor to the student, and as a tool for collaborative learning enabling students to acquire the necessary skills for the workplace and at the same time personalise their own learning. The rapid pace of the emergence of social networking technologies raises a number of pedagogic challenges and opportunities for academics and staff developers. If we are to meet the expectations of the net generation learner it is important for practitioners to be provided with opportunities to continuously update themselves with the increasing possibilities that these technologies afford in the education sector, and their potential to enhance knowledge development and transfer. In order to use these technologies to complement traditional class based models of teaching and learning staff need to be provided with the appropriate support, knowledge and skills required to develop a complementary online and face to face learning experience. "Contact hours" need to be reconsidered, if courses are to be redesigned using the model presented in this paper: a student-driven activity based learning approach, whereby the tutor sets up the learning environment, develops complementary assessed activities this takes

preparation time, we also need to address institutional and departmental quality assurance mechanisms and processes. And what about other colleagues who are teaching different courses how will they react?

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C.vii Developing A Web 2.0 Pedagogy To Engage The Net Generation Learner In A Community For Learning In Higher Education

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Abstract

The widespread availability of technologies, such as laptops and mobile phones, and the increasing adoption of Web 2.0 technologies (e.g. Wiki, Blogs and podcasts), suggests that Web 2.0 as a powerful educational tool has come of age, providing challenges as well as exciting opportunities to meet the individual needs of an increasingly diverse range of learners. Since this work began over five years ago, Web 2.0 technologies have been incorporated into institutional resources across different managed and virtual environments, and opportunities for funding across the HE sector has been made available in an effort to provide 'the best possible learning experience' for our students.

This paper presents a Web 2.0 pedagogical model which is underpinned by social constructivism and the principles of 'good teaching and learning practice'. This model continues to be used across a number of subject disciplines in Higher Education.

The model is presented and its impact on the learner experience over a number of years is measured.

Evidence of the impact on the learning experience is provided from the results of a pre and post test questionnaire which was distributed prior to and shortly after application of the model. *The results indicate the technology's benefits and its barriers-to-use.* To test for significant differences in the questionnaire responses a Wilcoxon Signed- Rank test was performed.

In addition, content analysis was carried out using the learners' own reflections as documented in their Blogs, thus providing insights into the perception of their learning experience, and validating the findings from the pre- and post test questionnaire results.

This paper will add to the debate on the learner experience using web 2.0 technologies, collaborative learning and assessment underpinned by social constructivist theory.

Introduction

The underlying conceptual framework is deeply rooted in educator's experiences of using a blended social constructivist approach; the blended

approach combines technologies outside of the classroom with face-to-face class-based activities (Doolan, 2008, MacDonald, 2008). This blended approach brings together a rich educational experience based on a collection from readings on social constructivism as the foundation for the use of technology to support pedagogical practice developing a deep awareness and appreciation of what can happen when merging the two; leaving behind footprints in innovate educational practices The social constructivist approach engages learners' collectively and collaboratively through assessed individual and group based learning activities to construct, and share knowledge through interactions (Vygotsky, 1978), and by forming relationships (Lave and Wenger, 1991) with others based upon the foundation that learning is a social activity (Wenger, 1997).

This study continues to be a work in progress with practice and findings presented over five years. In the first year of the study a Wiki was used in practice to provide further opportunities for collaborative learning and assessment. Moreover, the building of a community of learning (Doolan, 2006; Paloff, & Pratt, 1999) whilst at the same time helping create a sense of belonging to that community amongst second year learners studying on a computing course Following this the intention was to explore how best to accommodate our current learners who are technology savvy whilst at the same time support collaborative learning and assessment (Doolan, 2007). In each year of the study a Wiki has been used to act a as catalyst for learners to share co-constructed resources during collaborative learning and

assessment inter and intra groups. The design and practice remains deeply grounded in the social constructivist theory (Vygotsky, 1978).

This paper presents an overview of the statistical impact following the introduction at that time; of providing learner choice in using new emerging web 2.0 technologies: podcast (audio) and video (Jumpcut) in addition to the required use of a Wiki. An overview of the findings from learner Blogs is presented the qualitative data findings are explored in (Doolan, 2006 & 2007). As in previous years the rationale for use remained the same. Learners used Jumpcut a video editing tool to produce video and podcasts to produce audio recordings as outcomes from their collaborative based assessment activities. These in itself were not assessed rather were used in driving curriculum objectives in particular the assessed learning outcomes of knowledge and understanding of subject content.

In summary the audio and video was developed by the tutor and uploaded onto a Wiki to provide support for learners whilst completing the core learning activity given the other learning activities were dependent on its completion. The assessed report consisted of solutions to five sets of learning activities and included: the core activity: eliciting and documenting requirements to build computer software. This was required to be completed as all other learning activities were dependent on its completion. The learning activities were set taking into consideration that active student engagement requires the chosen activities to be shared equally within and across a learner group whilst using a collaborative learning approach (Doolan, 2007;2008; Doolan et al, 2006), with an emphasis on learning by doing and an emphasis on

understanding and a deep approach to learning (Biggs, 2003). Moreover, the activities in this study were set to support the personalised learning concept (Doolan, 2008, DFES, 2005) and learner autonomy (DFES, 2005). Whilst at the same time empower learners to create their own dynamic learning environments, and create their own learning outcomes collaboratively. It was also important that learners take control of their own learning activities and be motivated to feel ownership for their learning whilst working and relating to others.

Therefore, the collaborative assessment activities were chosen specifically to be shared and jointly owned within each group and shared across groups. Learners were provided with different case studies intended to minimize the possibility of plagiarism whilst providing learners with a wealth of resources via the Wiki at the same time nurturing a culture of resource sharing using the Wiki. The case studies provided were intended to represent as near as possible a “real world” industrial experience (Kolb, 1984).

Pedagogical Model

This section provides an overview of the pedagogical model developed over the past five years of this work. The **Social Learning and Assessment using Technology in Education (SLATE)** (Doolan, 2010) strategies used in this study extend the seven principles of good practice in undergraduate education as outlined in table 1 (Chickering and Gamson, 1987). The principles are as follows:

Principle Good Practice

1...encourages contact between learners and faculty

2...develops reciprocity and cooperation among learners

3...uses active learning techniques

4...gives prompt feedback

5...emphasises time on task

6...communicates high expectations

7...respects diverse talents and ways of learning

SLATE strategies	Principles
<i>Relationship with students and teaching philosophy ... Approach Taken...</i>	1, 2, 3, 4, 6, 7
<i>Encourage students to produce learning resources...</i>	2, 3, 4, 7
<i>Learning Activities / Tasks... Active Learner engagement Learner and Tutor generated content – deep learning approach</i>	2, 3, 4, 5,6,7

<i>Technology – co-author, collaborate...</i>	2, 7
<i>Structure-Public area open to all learners and private group areas</i>	
<i>Establishing the culture, Preparing students...</i>	1, 2, 6, 7
<i>Setting and communicating clear directions / expectations</i>	
<i>Communicating clear directions / expectations</i>	1, 2, 4, 7
<i>Clear boundaries i.e. trust, respect, share, scholarly practice...</i>	
<i>Supporting social presence,</i>	1, 2, 6, 7
<i>Nurturing student relationships</i>	

Table 1: SLATE strategies

The SLATE strategies provide a context for the tutor to consider both in the design and implementation process when introducing the use of technology such as a Wiki, and podcast with learners, and identifies what this means in “good “practice when using the SLATE model (Doolan, 2010).

Questionnaire Design

A Questionnaire comprised of 50 questions was used to gain an understanding of learner attitudes both before and after using technology

including a Wiki to support collaborative learning and collaborative assessment. The questionnaire was designed using an EDPAC form which automates the process enabling an Optimal Mark Reader to read the data, which was then imported into Excel for analysis. This procedure was familiar to the tutor and learners in this study as this is the standard form used by the university to obtain student feedback at the end of each module.

Attitude was measured using a Likert scale and for each statement learners rate their attitude on a continuum from Strongly Agree, Agree, No View, to Disagree, or Strongly Disagree as described by Oppenheim (1992).

The statements were grouped together under headings as a series of questions in categories in sequence, each being concerned with a different category: Questions 1 – 8 related to population data and is not included in this study. Question 9 to 13 inclusive were categorised as “Group-work” to measure the experience of working collaboratively, Question 14 to 17 was categorized as, “Group-work Assessment” to measure the experience of working collaboratively whilst undertaking the collaborative assessment “Question 18 to 25 was categorized as “Learning Resources” was intended as an attitudinal measure to ascertain the impact of the learning resources provided by the tutor for example; the planning and preparation activities, the materials and templates provided etc. And the category “Wiki and StudyNet” relates to questions 26 to 42 and was intended to measure attitudes to the use a Wiki farm linked to the institutional resources and finally “Collaborative Learning Technologies” related to the use for question 4 up to and including question 50.

The order of questions was based on the logic of the study and to aid respondents providing guidance for completion in addition to instructions included in the questionnaire to help in completing the total number of 50 questions.

The questionnaires were completed by respondents in a scheduled lecture where learners were provided with detailed instructions on an overhead slide on how to complete the questionnaire. In addition to the instructions provided in advance of the lecture and documented on the questionnaire. Learners were informed that they have the right to opt out of the research process at any stage. The approach of lecture completion was taken to avoid data contamination through copying, talking, or asking questions (Oppenheim, 1992) however; there is no guarantee that this was indeed the case.

Analysis of the Responses

In a repeated measures design, 60 students participating on the computing course of which 44 (73%) responded to both the pre test and post test questionnaires. However, on some occasions not all questions were answered and this n value is reflected in the individual results.

The questions were stated in the form of statements to which the student could reply in different degrees of agreement.

The responses A to E for each of the questions were coded as follows: A (“Strongly Agree”) = 4, B (“Agree”) = 2, C (“Neutral”) = 0, D (“Disagree”) = -2, E (“Strongly Disagree”) = -4.

The questions were classified as belonging to the categories “I. Group-work”(Q9 - 13), “II. Group-work Assessment” (Q14 - 17), “III. Learning Resources” Q18 - 25), “IV. Wiki and StudyNet” (Q26 - 42) and “V. Collaborative Learning technologies” (Q43-57).

Because of the ordinal measurement scale of the responses, a Wilcoxon Signed-Rank test was performed on the ordinal data for each of the 49 questions to determine whether or not there was a difference in response between the pre test and post test condition.

To establish significant differences in the frequency of replies between the response classes A – E, chi-square tests were carried out for each of the 50 questions. To ensure sufficiently occupied classes, A, B and D, E were lumped to form the classes “Agree” (A + B), “Neutral” (C) and “Disagree” (C + D).

Spearman Rank correlation tests were done (separately for pre- and post conditions) between the responses belonging to the same question category to find out which statements were regarded as equivalent by the subjects. The outcomes of these tests lead me to combine the scores of correlated responses by averaging them and reduced the original 50 statements to 27.

In view of the large number of tests, it should be noted that a number of significant results could have occurred by chance alone and care should be

taken when interpreting such a large number of results. I therefore used an experiment-wise error rate of $\alpha = 0.002$ after Hochberg's improved "Bonferroni" procedure (Hochberg, Y. 1988) in place of the customary significance level of 5%.

Results

Chi-square tests showed that the majority of the pre- and post test responses evoked significance differences in response frequency between "Agree", "Neutral" and "Disagree" with a clear bias towards "Agree". However, the Wilcoxon tests demonstrate that the students changed their opinion only for the following three statements

Statement 9. "I feel happy to work in group assignments" (Figure 1)

Results from pre and post test questionnaires showed a less positive attitude towards working in group assignments, following the group based assignment.

The distribution of responses to Statement 9 significantly differs from a uniform distribution; it shows a large number of agreements and a low number of disagreements prior the experience of working in groups (Pre-test: $\chi^2 = 38.77$, $df = 2$, $p < 0.001$; Post-test: $\chi^2 = 13.58$, $df = 2$, $p = 0.001$). However, after the experience the negative responses clearly increased, to the extent that a Wilcoxon MPSR Test indicated a significant difference in

attitude (Median pre-test = 2, $N_{pre} = 43$, Median post-test = 0, $N_{post} = 44$, Wilcoxon's Test Statistic $T = 48$, $Z = 3.752$, $p = 0.0002$).

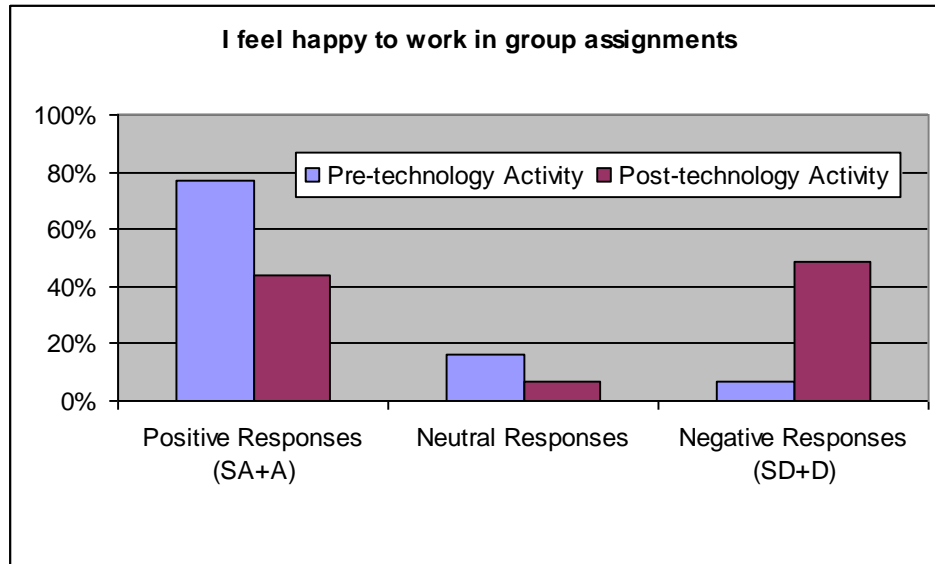


Figure 1. Distribution of responses to statement 9 of the “Group-work” category.

Statement 31 “Being able to edit others work supported my learning”
(Figure 2)

Participants had a more positive attitude towards being able to edit others work using the Wiki after using the social media for the group based assessment.

The frequency of responses to statement 31 is highest for the “Neutral” class before the experience, but changes in favour of “Agree” after the experience

(Pre-test: $\chi^2 = 6.05$, $df = 2$, $p = 0.05$ (NS) ; Post-test: $\chi^2 = 34.37$, $df = 2$, $p < 0.001$).

Only the distribution of the post-test condition differs significantly from uniformity. Correspondingly, the Wilcoxon test showed a significant shift from a neutral attitude before the experience (Median = 0, $N_{pre} = 44$) towards agreement with the statement (Median = 2, $N_{post} = 43$) (Wilcoxon's Test Statistic $T = 119$, $Z = 3.362$, $p = 0.0008$).

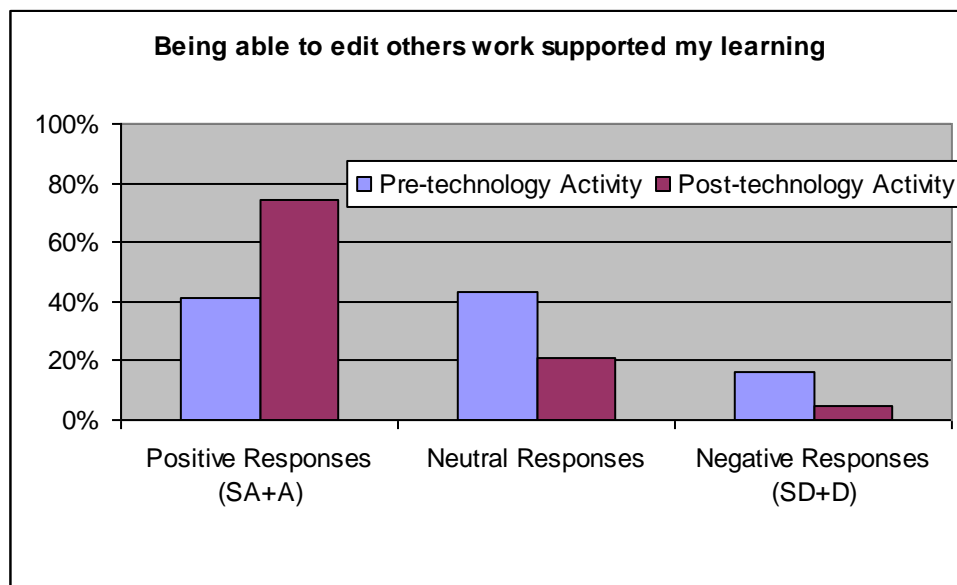


Figure 2. Distribution of responses to question 31 of the “Wiki and StudyNet” category.

Statement 35. “In the online learning environment I felt in control of my own learning” (Figure 3)

After the experience learners felt no longer in control of their learning however, they felt that online learning environment did help them to feel a sense of belonging to their individual group following the collaborative experience and the group based assessment.

Results from pre and post test questionnaires learners showed a less positive attitude after the collaborative learning and assessment experience with respect feeling in control of their learning. The distribution of responses is similar to those to statement 9, with a shift towards “Disagree” after the experience (Pre-test: $\chi^2 = 22.43$, $df = 2$, $p < 0.001$; Post-test: $\chi^2 = 9.86$, $df = 2$, $p = 0.007$ (NS)).

Likewise, the Wilcoxon test showed a significant shift towards a negative attitude (Median pre test = 2, $N_{pre} = 44$, Median post test = 0, $N_{post} = 42$, $T = 88.65$, $Z = 3.165$, $p = 0.0016$).

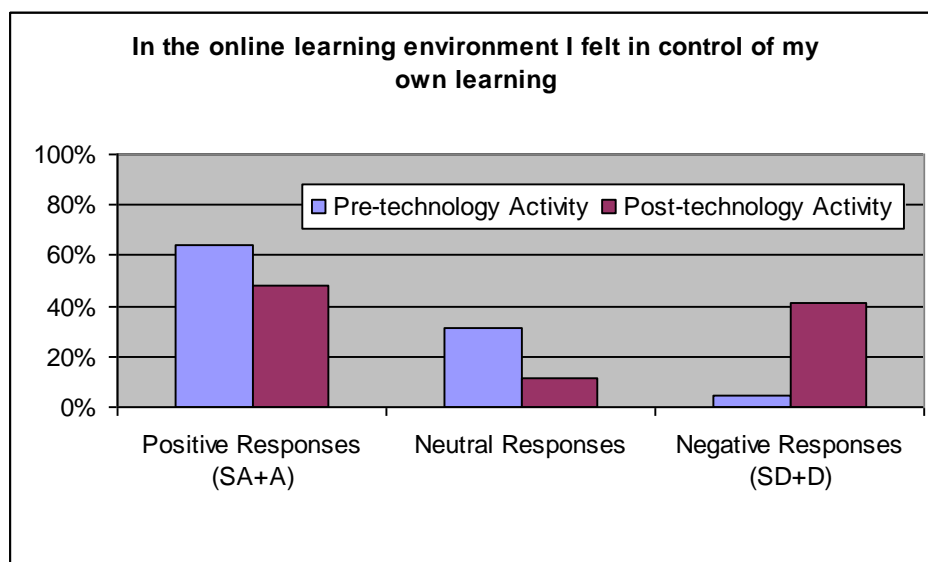


Figure 3. Distribution of responses to question 35 of the “Wiki and StudyNet” category.

Summary of Findings

After using a Wiki for collaborative learning and having completed the collaborative assessment learners were more positive after the experience than their perception prior to that experience. It was evident from the reflective Blogs that learners valued the opportunity to structure their own learning. The Wiki nurtured this as it has no fixed structure and provides pages that can be constructed and authored by any user; with access rights. The learners found the ability to structure and edit their peers was beneficial after the establishment of social rules and norms.

Learners were unhappy to work on group assignments following the collaborative learning and assessment experience which took place in groups of three and four. This may be correlated with the findings that significantly learners would like to see their tutor intervene in the group work. In the reflective Blogs learners experienced problems with group members who failed to participate and contribute equally to the assessment. However, this was taken into consideration during the design of the learning activities in this study given that the half were required to be completed collaboratively the remainder; a group commitment and the reflective Blog were individual assessed activities. It is evident from the Blogs that learners failed to recognise this although it was clearly documented on the assignment specification in paper format and on the Wiki.

There was an overwhelming majority of students who felt out of control of their learning having completed the collaborative learning and assessment

activities using the web 2.0 technologies. This needs further exploration and alignment with other findings in the literature. However, the changes in the study this year and as presented in this paper provided students with the use of more technologies than in the previous year.

Although so far in-conclusive, initial evidence points to too much technology use and providing choice on a second year course may be problematic in learners engaged in collaborative learning and assessment and lead to learners' loss of control over their learning.

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Author Biography

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Appendix D

Research Validation

D.i Mix sent to independent researcher

P	N	Dk	
			group could continue with the work if they were not in a meeting
			each member could add and remove the content in their own time
			reduces the amount of information a third less words per unit
			interact with each other in their own time
			data that has been put up clearly and easily unlike face to face where may not understand a fellow members handwriting
			great for group members to come together
			be able to meet on a required day for a meeting
			so if I put my idea forward either in text, images or diagram and am not correct someone else in our group can edit it
			tasks can be left incomplete
			not being able to see the other person
			the conversation flow is easier face to face online responses could be parallel
			lack of confidence within group
			we all prefer to meet face to face that way you get a feel for what the person is like
			you have almost total and complete privacy you can dress as you like, sit as you like, you have quite a lot of freedom
			allows anyone to communicate anytime of the day, anywhere

		communication online may not be the perfect environment
		some members may have restrictions use of the internet from 6pm to 12am
		the communication was less personal which could make the individual feel comfortable
		no variation in text, no one will know who wrote what, confusing
		time lapse between messages allows for reflection
		online means 24/7 so people can express their point at any time of the day or night
		time consuming as reading and editing everyone else's thoughts
		written responses can be seen as less impulsive and more censored than spoken responses, even to the same question
		online everything is documented
		thoughts or ideas might be misunderstood
		messages and ideas can be left and replied to when and where it suits
		need for good internet connection which some people may not have
		flexibility of access, anywhere, anytime
		opportunities for group to help us develop our written
		asynchronous-delays reactions to comments
		less emphasis on social interaction, therefore more time can be concentrated on getting the work done
		a lot of time spent working online
		may be times where some group members are unable to meet

			find discussing online more comfortable
			the leader of the group facilitates the discussion and ensure that all members become involved
			everyone contributes and there is a record for reflection after the event

D.ii Mix returned from independent researcher

P	N	Dk	
✓			group could continue with the work if they were not in a meeting
✓			each member could add and remove the content in their own time
		✓	reduces the amount of information a third less words per unit
✓			interact with each other in their own time
✓			data that has been put up clearly and easily unlike face to face where may not understand a fellow members handwriting
✓			great for group members to come together
✓			be able to meet on a required day for a meeting
✓			so if I put my idea forward either in text, images or diagram and am not correct someone else in our group can edit it
	✓		tasks can be left incomplete
		✓	not being able to see the other person

	✓		the conversation flow is easier face to face online responses could be parallel
		✓	lack of confidence within group
	✓		we all prefer to meet face to face that way you get a feel for what the person is like
✓			you have almost total and complete privacy you can dress as you like, sit as you like, you have quite a lot of freedom
✓			allows anyone to communicate anytime of the day, anywhere
	✓		communication online may not be the perfect environment
	✓		some members may have restrictions use of the internet from 6pm to 12am
✓			the communication was less personal which could make the individual feel comfortable
	✓		no variation in text, no one will know who wrote what, confusing
✓			time lapse between messages allows for reflection
✓			online means 24/7 so people can express their point at any time of the day or night
	✓		time consuming as reading and editing everyone else's thoughts
		✓	written responses can be seen as less impulsive and more censored than spoken responses, even to the same question
✓			online everything is documented
	✓		thoughts or ideas might be misunderstood
✓			messages and ideas can be left and replied to when and where it suits
	✓		need for good internet connection which some people may not have
✓			flexibility of access, anywhere, anytime

✓			opportunities for group to help us develop our written
	✓		asynchronous-delays reactions to comments
✓			less emphasis on social interaction, therefore more time can be concentrated on getting the work done
		✓	a lot of time spent working online
		✓	may be times where some group members are unable to meet
✓			find discussing online more comfortable
✓			the leader of the group facilitates the discussion and ensure that all members become involved
✓			everyone contributes and there is a record for reflection after the event

D.iii Cohen Kappa

Agreement matrix

		Researcher 1		
		Pos	Neg	DK
Researcher 2	Pos	20	1	0
	Neg	0	10	0
	DK	3	3	1

RES1	RES2	COUNT
1	1	20
1	2	0
1	3	3
2	1	0
2	2	10
2	3	2
3	1	0
3	2	0
3	3	1

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
res1 * res2	36	100.0%	0	.0%	36	100.0%

res1 * res2 Crosstabulation

Count		res2			Total
		1	2	3	
res1	1	20	0	3	23
	2	0	10	2	12
	3	0	0	1	1
Total		20	10	6	36

Symmetric Measures

		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Measure of Agreement	Kappa	.746	.094	5.863	.000
N of Valid Cases		36			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

D.iv Student Task Data

D.iv.i. Cohort 2005 - 2006

ID	Group	Total	T1 (5)	T2 (40)	T3 (20)	T4 (20)	T5 (15)
1	1	17.5	5	40	20	18	15
2	1	17.5	5	40	20	18	15
3	1	17.5	5	40	20	18	0
4	1	17.5	5	40	20	18	15
5	1	17.5	5	40	20	18	15
6	1	98	5	40	20	18	15
7	2	73.5	4.5	20	20	17	12
8	2	74	5	20	20	17	12
9	2	74	5	20	20	17	12
10	2	74	5	20	20	17	12
11	2	74	5	20	20	17	12
12	3	12	0	0	0	0	12
13	3	72	5	30	10	15	12
14	3	72	5	30	10	15	12
15	3	74	7	30	10	15	12
16	3	32	5	0	0	15	12
17	3	72	5	30	10	15	12
18	4	76.5	4.5	40	10	12	10
19	4	77	5	40	10	12	10

20	4	76.5	4.5	40	10	12	10
21	4	76.5	4.5	40	10	12	10
22	4	76.5	4.5	40	10	12	10
23	4	76.5	4.5	40	10	12	10
24	5	48	5	15	10	10	8
25	5	46	5	15	8	10	8
26	5	46	5	15	8	10	8
27	5	8	0	0	0	0	8
28	5	38	5	15	8	10	0
29	5	46	5	15	8	10	8
30	6	39	5	10	8	8	8
31	6	37	5	10	8	8	6
32	6	31	5	10	8	8	0
33	6	37	5	10	8	8	6
34	6	37	5	10	8	8	6
35	6	37	5	10	8	8	6
36	7	72	5	40	5	10	12
37	7	72	5	40	5	10	12
38	7	60	5	40	5	10	0
39	7	72	5	40	5	10	12
40	7	72	5	40	5	10	12
41	7	72	5	40	5	10	12
42	8	50	5	20	5	12	8
43	8	50	5	20	5	12	8
44	8	18	5	0	5	0	8
45	8	50	5	20	5	12	8
46	8	27	2	20	5	0	0
47	8	47	2	20	5	12	8
48	9	39	5	15	5	6	8
49	9	39	5	15	5	6	8
50	9	39	5	15	5	6	8
51	9	39	5	15	5	6	8
52	9	39	5	15	5	6	8
53	10	44	5	20	5	8	6
54	10	44	5	20	5	8	6
55	10	43	4	20	5	8	6
56	10	44	5	20	5	8	6
57	10	44	5	20	5	8	6
58	10	44	5	20	5	8	6
59	11	27.5	4.5	15	2	2	4
60	11	27.5	4.5	15	2	2	4
61	12	33	5	15	5	4	4
62	12	33	5	15	5	4	4
63	12	29	5	15	5	4	0
64	12	33	5	15	5	4	4
65	12	33	5	15	5	4	4
66	12	33	5	15	5	4	4
67	13	45.5	5	30	4	2.5	4
68	13	43.5	5	30	4	2.5	2
69	13	43.5	5	30	4	2.5	2

70	13	42.5	4	30	4	2.5	2
71	13	43.5	5	30	4	2.5	2
72	13	43.5	5	30	4	2.5	2
73	14	46	5	30	5	4	2
74	14	46	5	30	5	4	2
75	14	44	5	30	5	4	0
76	14	46	5	30	5	4	2
77	14	46	5	30	5	4	2
78	14	46	5	30	5	4	2
79	15	45.5	5	30	5	3.5	2
80	15	0	0	0	0	0	0
81	15	35.5	5	20	5	3.5	2
82	15	35.5	5	20	5	3.5	2
83	15	35.5	5	20	5	3.5	2
84	15	33.5	5	20	5	3.5	0
85	15	35.5	5	20	5	3.5	2
86	16	28	2	20	1.5	2.5	2
87	16	28.5	2.5	20	1.5	2.5	2
88	16	26.5	2.5	20	1.5	2.5	0
89	16	0	0	0	0	0	0
90	16	28.5	2.5	20	1.5	2.5	2
91	17	0	0	0	0	0	0
92	17	0	0	0	0	0	
93	17	0	0	0	0	0	0
94	17	2	0	0	0	0	2
95		0					0

D.iv.ii. Cohort 2006 – 2007

ID	Group No	Total	T1(5)	T2 (40)	T3 (20)	T4 (20)	T5 (15)
1	1	97	5	40	20	17	15
2	1	97	5	40	20	17	15
3	1	97	5	40	20	17	15
4	1	97	5	40	20	17	15
5	1	97	5	40	20	17	15
6	1	97	5	40	20	17	15
7	2	31	1	20	0	7	3
8	2	28	1	20	0	7	0
9	2	34	1	20	0	7	6
10	2	0	0	0	0	0	0
11	2	0	0	0	0	0	0
12	2	38	1	20	0	7	10
13	3	39	0	22	6	8	3
14	3	41	0	22	6	8	5
15	3	46	0	22	6	8	10
16	3	36	0	22	6	8	0
17	3	39	0	22	6	8	3
18	3	43	0	22	6	8	7
19	4	59	4	25	8	10	12

20	4	59	4	25	8	10	12
21	4	59	4	25	8	10	12
22	4	59	4	25	8	10	12
23	4	59	4	25	8	10	12
24	4	59	4	25	8	10	12
25	5	39	1	10	10	8	10
26	5	42	1	10	10	8	13
27	5	35	1	10	10	8	6
28	5	0	0	0	0	0	0
29	5	31	1	10	10	8	2
30	5	32	1	10	10	8	3
31	6	52	4	32	2	8	6
32	6	51	4	32	2	8	5
33	6	51	4	32	2	8	5
34	6	0	0	0	0	0	0
35	6	56	4	32	2	8	10
36	6	56	4	32	2	8	10
37	7	50	0	20	12	10	8
38	7	50	0	20	12	10	8
39	7	52	0	20	12	10	10
40	7	49	0	20	12	10	7
41	7	50	0	20	12	10	8
42	7	0	0	0	0	0	0
43	8	34	0	15	2	12	5
44	8	29	0	15	2	12	
45	8	0	0	0	0	0	0
46	8	37	0	15	2	12	8
47	8	37	3	15	2	12	5
48	8	29	0	15	2	12	0
49	9	35.5	3.5	10	6	8	8
50	9	37.5	3.5	10	6	8	10
51	9	30.5	3.5	10	6	8	3
52	9	29.5	3.5	10	6	8	2
53	9	35.5	3.5	10	6	8	8
54	9	39.5	3.5	10	6	8	12
55	10	43	1	20	5	9	8
56	10	39	1	20	5	9	4
57	10	40	1	20	5	9	5
58	10	42	1	20	5	9	7
59	10	37	1	20	5	9	2