A critical analysis to explore the extent to which cases of asynchronous online discussions support collaborative learning

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I hereby declare that, except where explicit attribution is made, the work presented in this thesis is entirely my own.

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Abstract of the thesis

Title: 'A critical analysis to explore the extent to which cases of asynchronous online discussions support collaborative learning'

There is such a wide variety of uses of this term 'collaborative learning' inside each academic field, and a fortiori, across the fields (Dillenbourg, 1999).

However, in terms of the recent focus of CSCL (computer supported collaborative learning), in effective collaborative knowledge building, the group must engage in thinking together about a problem or task and produce a knowledge artefact such as a verbal problem clarification, a textual solution proposal, or a more developed theoretical inscription that integrates their different perspectives on the topic and represents a shared group result that they have negotiated (Stahl, 2006). As a consequence, collaborative learning should combine 'constructionism' with 'social learning' (Laurillard, 2009).

From this perspective, collaboration cannot be considered as a condition and support for individual cognition, rather it should be conceptualised as an effective means of developing group meaning through the interactions among the group's individual members, not by the individuals on their own.

The idea of this thesis is to analyse and critique the mechanism of knowledge construction happening inside the boundary of the asynchronous discussion forums which are often referred to as the 'collaborative environments'. The objective of the research is to investigate how far the contemporary design of the learning environment and the process of facilitating the general approach of collaborative interactions are compatible with the theoretical assumptions of the ideal form of collaborative learning.

Conceptualising collaboration on a continuum of six consecutive processes, the content analysis model originally illustrated by Murphy (2004), has been used in this research for the identification and measurement of collaboration in four

different asynchronous discussions where critical emphasis was given to analyse the process of group meaning making from the qualitative point of view, mainly by micro analysis of the messages. As in an evaluation context, the aim of this research project is to document and analyse the process, as well as the quality, of the asynchronous collaborative discussion, so the Case Study method has been chosen as an effective means to carry out the research. The data gathered from semi-structured interviews with the tutors and the texts of the online classes have been combined in order to develop a comprehensive view of the collaborative online discussions taking place.

The research findings reveal that the participants' interactional involvement with the collaborative situation appears to be highly influenced by the way the practice environment has been designed, especially in terms of *task design* and the nature of *involvement of the tutor* in the learning process. The findings support the suggestion that these two factors are likely to be guided by the *perception of the tutor about collaborative engagement.*

Through illuminating the essential characteristics of collaborative interactions in asynchronous online discussions, this research has attempted to make explicit the way that tutors can recognise both the process and the quality of collaboration taking place during online asynchronous discourse. The research findings include proposals for sound 'pedagogical design principles' that might support tutors better in designing collaborative learning. Moreover, the detailed presentation of collaborative interactions could enrich the experience of the student participants in terms of their desired involvement in collaborative interactions. And finally for the educational institutions and technology designers, this study can provide useful guidelines for overcoming the ideologies of 'individualism' and supporting the concept of 'group achievement'.

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Chapter one: Introduction

1.1 Introduction: The rationale of the thesis

It is a widely accepted fact that employment today is far different than the trades and industry based work of previous generations. The current employment market is characterized by smaller commercial organizations predominance of light manufacturing and information focused services (Catherall, 2005). In this scenario the importance of skill development to meet the demands of a flexible and uncertain job market is proving vital both for retaining in the event of career change and for providing relevant skills in a climate of rapid technological development. This demand is being reflected in a common trend where adults returning to learning full time or part time often on more than one occasion in their lifetime in order to refresh their knowledge, upgrade their skills and sustain their employability. Now those adult learners who are over the age of 35 years, who have full time jobs (for example in U.K Claire Callender's research, 2006 has shown that 83% of part-time students are in employment), families and limited discretionary time, it is quite difficult for them to go for the traditional campus based programs. The age profiles as well as their demands for skills generally opt for those courses which are being offered through distance mode, mainly these working adults look for those options which can give them more convenience in scheduling classes, decrease travel time to and from campus and allow them to take control over when participation in classes will occur. Under this circumstance the general assumption suggests that online approach is the most logical solution.

The common pre-conception in the field of online learning is that the enormous power of technology, the Web, the Internet and associated learning technologies can produce a climate in which e-learning is seen as a means towards improving Higher Education learning and teaching (Garrison and Anderson, 2003; Laurillard, 2002; McConnell, 2000). Therefore a common recommendation is that the learning technologies should not only be used for developing, organising and managing access to online content. The normal pedagogy which is based on the delivery of content-centric instruction via a transmission model of learning should

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be transformed into learning environments for multi-user 'collaborative activities' or the 'co-construction of knowledge' - both representative of current learning theory (Gibbs and Gosper, 2006, pp.47-48).

From the pure theoretical perspective of ideal 'collaborative learning' in the social learning environment, students should not simply socialise and exchange their personal reactions or opinions about the subject matter, but should develop a theory, model, diagnosis, conceptual map, mathematical proof, or presentation (Stahl, 2006). The group must engage in thinking together about a problem or task and produce a knowledge artefact such as a verbal problem clarification, a textual solution proposal, or a more developed theoretical inscription that integrates their different perspectives on the topic and represents a shared group result that they have negotiated (Stahl, 2006). The translation of this theoretical proposition into the practical application of computer mediated interaction has been termed as 'computer supported collaborated learning' or CSCL.

In the last few years, we have seen growing excitement within the educational community about Web 2.0 technologies. Citing the comment made by Dede (2008), Selwyn (2009), proposed that in particular, it has been argued that Web 2.0 practices have a strong affinity with socio-cultural accounts of 'authentic' learning where knowledge is co-constructed actively by learners with the support of communal social settings – taking the form of constantly reassessed 'collective agreement'. For that reason, a great deal of attention has been paid to the personalised and socially situated forms of learning (intended or otherwise) that can be found within Web 2.0 practices, with learners said to gain from participatory experiences in the co-construction of online knowledge (e.g. Lameras et al., 2009).

The use of asynchronous online discussion may be considered the first step towards the use of Web 2.0 philosophy in the formal educational approach as there is significant opportunity for user interaction and content contribution as opposed to the general feature of Web 1.0, considered as read only web. From that perspective, the recent versions of Web 2.0 can easily be considered as the technological innovation. However, the learning technologies depend for their success upon being embedded properly into the existing learning context. The applications of these newly invented educational technologies will necessarily

require changes in what exists already, and if this is not acknowledged and accommodated then the innovation will not succeed (Laurillard, 2002). As it has been portrayed by Ravenscroft, (2009), for each technological wave, often researchers and research centres have adopted the new applications with a great hope that the new inventions could have the enormous powers to address the fundamental problems with learning. However, till to date none of these revolutions has occurred and surprisingly our collective memory is so poor that we quickly jump onto the next technological bandwagon without learning lessons from the one we were previously riding. Consequently, for the true enrichment of the existing methodology of teaching and learning, there should be a proper orchestration between the technology development and its use guided by the theoretically informed frameworks and models of specific pedagogical approach in use. Therefore rather than being over excited about the potential of the new educational technologies of Web 2.0, it is important to step back and consider whether the concept of collaborative learning has been applied properly in the use of asynchronous discussion forums, i.e. in the so called early version of Web 2.0.

From the theoretical perspective, if it is assumed that the intended application of all CSCL formats needs the drastic change in perceptions about students' learning in CSCL environment, then it is worth analysing how far this proposition has been truly portrayed in the actual contextual application of asynchronous discussion and what makes it possible. Otherwise, once again thousands of hours and millions of dollars will be directed towards the optimistic exploration of how technology is capable of supporting, assisting and even enhancing the act of learning (Selwyn, 2010), where most of the cases the technologies will be at risk of being used merely to enhance conventional learning designs, rather than generate designs that are much more effective and innovative (Laurillard, 2009).

In practice, it could be hypothesised that online asynchronous discussions, or Web and text-based group interactions not occurring in real time, have the potential to facilitate and support many-to-many, learner(s)–to-learner(s) interaction vital to collaboration in online learning environments. However, while it might be desirable to promote collaboration in the context of online learning through use of an online asynchronous discussion, such collaboration will not automatically occur simply because peer-to-peer interaction is supported and facilitated.

Promoting collaboration in online learning begins with an understanding of the concept itself, followed by an understanding and recognition of how it might manifest itself in an online context (Murphy, 2004).

Therefore, from the practical perspective, we may label any asynchronous discussion based learning environment as a 'collaborative' one, but incorporating all these theoretical parameters into practice is a huge challenge for the tutors.

The idea of this thesis is to analyse and critique the mechanism of knowledge construction happening inside the boundary of the asynchronous discussion forums which are often referred to as the 'collaborative environments'. The objective of the research is to investigate how far the contemporary design of the learning environment and the process of facilitating the general approach of collaborative interactions are compatible with the theoretical assumptions of the ideal form of collaborative learning.

1.2   The Structure of the thesis

The structure of this thesis is divided into eleven Chapters.

1.11 Chapter one

The first one (this Chapter) is the **'Introductory Chapter'** which can provide the insight of the synopsis of the research along with the organisation of the thesis. This Chapter introduces the thesis. The previous sections have already made an attempt to outline the focus of the research and why it is important. The rest of the Chapters can offer the straightforward view to the readers in terms of rationale for each Chapter and how the research has built up.

1.12 Chapter two

The second Chapter is the **'Literature review'**. In this research project the fundamental interest is very much intertwined with the concept of computer supported collaborative learning. Therefore the discussion in the literature review Chapter has started with the consideration of the significance of distance

education programmes and the idea of e-learning to promote flexibility. However rather than focusing on the various models of e-learning, the literature search is closely confined in area of the asynchronous discussion forum, in terms of its potential to advance the idea of group based learning. Sincere attempts have been made to impart the rationale for the learning in a multivoiced environment which then gradually has been elaborated by introducing the concept of computer supported collaborative learning. Furthermore, supposing that using a CSCL environment is no guarantee of productive student interaction or positive effects on learning, I have considered factors (through the exploration of previous researches) that might affect a positive outcome. In fact under the 'conditional paradigm of CSCL' (i.e. the factors influencing CSCL), the role of the tutors and the effect of the task design are prominent in the literature review Chapter and the following Chapters of the thesis.

1.13 Chapter three

The third Chapter is all about the **'Theoretical perspective of research design'**. It has been hypothesised that without a theoretical model of the collaborative learning process, it is impossible to identify empirical indicators that will form the basis of a coding instrument as a standard against which to evaluate whether or not effective learning is occurring in the online discussions (Gunawardena et. al., 2001). Consequently as the effective theoretical framework of collaborative learning, in this research it has been hypothesised that in the context of collaborative interactions the fundamental focus is on the phenomena such as the negotiation and sharing of meanings along with the construction and maintenance of shared conceptions of tasks that can be achieved only through the interactivity in the group processes. Rather than solely focusing on how individuals function in a group discussion, the group itself has become the unit of analysis. From the research point of view the focus is on socially constructed properties of the interaction, in order to understand how the cognitive systems of the individual participants merge to produce a shared understanding of the problem due to the successful collaborative interactions.

1.14 Chapter four

The fourth Chapter is the **'Methodology'**. In this Chapter, the discussion is centrally focused on the general framework of the research methods adopted in this project. Considering the fundamental research interest to unlock the learning mechanism of asynchronous discussion forums in order to evaluate their effectiveness against the ideal 'collaborative environment', there is a need to adopt a technique that can extract the desired information from a body of material. This technique that has been utilised is 'content analysis' which can reveal information that is not situated at the surface of the transcripts. In fact the content analysis technique has been applied to analyse the transcripts of the conference messages in order to judge both the group collaborative process and the contribution of the individual to that process. However as in this research the theoretical framework of collaborative learning has been conceptualised from a specific point of view, the interaction analysis model does not evolve through the gradual analysis of data. In practice, the messages in the threaded discussions have been categorised under the defined categories of the pre-existing model which supports the same theoretical propositions of collaborative learning. Consequently, the proposed approach is the Case Study method. In an evaluation context, like the aim of this research project to document and analyse the process as well as the quality of the apparent collaborative approaches taking place in asynchronous collaborative discussion, Case Studies could be related to process evaluations. The Case Study research strategy is always accomplished through the use of multiple data sources as the various strands of data enhance the credibility of the empirical results. Therefore, in this study, the approach of multi method triangulation has been used as a process of combining the different sets of data, obtained from different instruments. The data gathered from semi-structured interviews with the tutors and to the text of the online classes (for the analysis of the threaded online discussions) have been combined in order to develop a comprehensive view of the collaborative discussions taking place in the asynchronous online context.

1.15 Chapter five

Chapter five, **'Content analysis of collaborative learning'**, is concentrated on the discussion about the selection of a suitable content analysis scheme along with the methodological issues specially focusing on the reliability and the validity of the research. In the content analysis scheme designed by Murphy (2004), the recognition of collaboration in the context of an asynchronous discussion forum involves identifying instances and manifestations of a range of processes along a continuum ranging from social presence to the production of a shared artefact. These six processes are 'social presence', 'articulating individual perspectives', 'accommodating or reflecting the perspectives of others', 'co-constructing shared perspectives and meaning', 'building shared goals and purposes', and 'producing shared artefact'. Moreover, recognition also involves identification of individual indicators of the different processes ranging from sharing personal information to sharing goals and purposes (Murphy, 2004). As a consequence, there is an explicit alignment between the theoretical positions suggested by Murphy in her model and the conceptual definition of collaborative learning adopted in this research. Therefore, in this project I have used an interactional model which is highly influenced by the existing model designed by Murphy (2004). Furthermore, this Chapter explicitly deals with the issue of inter rater reliability to establish the concrete validity of the proposed instrument. The last section of this Chapter provides the justification for selecting the model proposed by Anderson et al., (2001) to analyse the role of the tutor in the discussion forum for the successful achievement of the purported outcome of collaborative interaction. According to this model the role of the tutors is scrutinised in terms of three major categories,
1. Design and organisation,
2. Facilitating discourse and
3. Direct instruction.

1.16 Chapter six

The sixth Chapter is the **'Introduction to the Case Studies'**.
In this introductory section certain characteristics of the collaborative interaction have been specified as these characteristics are the basis for analysing the

threaded discussion to evaluate their effectiveness as collaborative learning. For example, it has been hypothesised that the state of evolving knowledge must be continually displayed by the collaborating participants to each other. The stance of each participant to that shared and disputed knowledge must also be displayed. Furthermore, the later part of this Chapter is much more focused to indicate the characteristic of task design, as one of the prime objectives of this research project is to assess the impact of task design on the effectual outcome of collaborative interactions.

1.17 Chapters seven, eight, nine and ten

The Chapters seven, eight, nine and ten are the **'Representation and the analysis of data'** associated with the Case Study one, two, three and four.

The Case Studies analyse the individual task design of every activity, as it has been hypothesised that to achieve the desired outcome of the collaborative interaction, the task design, and especially the instructional support could have a profound impact. The studies also analyse the extent to which students are guided to respond and participate in a manner from which they derive optimum benefits, mainly the objective is to assess the role of the tutor in the practice situation. The tutor's role has been analysed by using a model proposed by Anderson et. al., (2001). In the process of analysing the threaded discussion, Murphy's model is used to identify the existence of the six consecutive steps of collaboration in the threaded discussions in order to test the extent to which the discussion meets the criteria for being collaborative. Furthermore, there is the presentation of the qualitative data from the threaded discussion to represent the mechanism of knowledge construction in the learning environment.

In the end part of the analysis section of each Case Study, there is the representation of the information which has been acquired in the course of the semi structured interview with the tutor in order to make a connection between their perception about collaborative learning and their approach to using this strategy in real life practice, i.e. in the context of an asynchronous discussion forum. Finally, the last part of Chapters the empirical research findings, tries to demonstrate why in order to pursue and sustain a high-quality educational

experience, a deep understanding of the learning process is required. It proposes how this internal understanding could be beneficial for the tutors in designing (through effective task design and through their own strategic involvement) the learning situation to achieve the maximum productivity of collaborative interactions.

1.18 Chapter eleven

The last Chapter of the thesis covers **'Reflection and conclusion'**. This Chapter provides a summary of what has been done in this study and how the outcome of the research can enrich the overall experience of CSCL research. In fact this experience could cover a broad range starting from the experience of the tutor. Through the illumination of existing uses of collaborative interactions in the area of asynchronous online discussions, this research has attempted to make this sufficiently explicit that the tutors can easily recognise the process as well as the quality of collaboration taking place during the online asynchronous discourse. The detailed analysis of the study could help the tutors to reconsider the overall concept of collaborative learning from a different point of view. The research findings can be utilised effectively to develop the sound 'pedagogical design principles' that might support tutors better in designing collaborative learning. Moreover, there could be some value in putting the findings to students: the detailed presentation of collaborative interactions could enrich the experience of the student participants in terms of their desired involvement in collaborative interactions. And finally for the Institutions and the technology designers, this study can provide the useful guideline for overcoming the ideologies of 'individualism' and support the concept of 'group achievement'.

Furthermore, this Chapter also discusses the limitation of this empirical research.

Chapter two: Literature review

2.1 Introduction

Every literature review starts with a fundamental research interest as the interest itself encourages the researcher for the in-depth analysis of the research context, and motivates the researcher to focus on a particular area of research (or helps them to formulate the research question) after considering the major contribution of other researchers in a specific area of knowledge.

My literature review also starts with my fundamental research interest. A couple of years back; I found it really hard to complete my Masters (by traditional face-to-face approach) in the U.K thousands of miles away from my family and home. At that time I always thought, there would be so many people like me who wanted to continue study but at the same time they had other commitments and responsibilities. Especially for this segment of people we need that approach of teaching and learning which can give the maximum flexibility along with quality. In this situation one simple solution can come to our mind in the form of distance education mainly the online learning (the instant access to the materials or the tutors, no need to depend on the post for print based materials).

From the logistical perspective, online learning is enormously helpful in terms of flexibility, however from the pedagogical perspective what could be expected from this new medium of instruction? The field of virtual learning environments offers the possibility of a shift away from traditional transmissive views of teaching and learning towards constructivist views of knowledge sharing, mainly because of the affordances of these learning technologies. This fundamental concept of knowledge sharing or social construction of knowledge has now become a general recommendation for e-learning practices.

In this literature review, my first step is to figure out, what is the significance of distance education in today's Higher Education which might be helpful for conceptualising the practical demand for e-learning (as an obvious application of distance education) in educational settings. Furthermore, to evaluate the productivity of this new approach to teaching and learning, it is important to analyse how the conventional pedagogical framework can be changed by using

digital technologies. If the objective is to monitor how e-learning could be helpful to connect people with each other, it is important to highlight the potential of asynchronous online discussion. From the theoretical point of view, asynchronous online discussion is based on the principle of knowledge construction in a social environment or in other words, the theoretical proposition of learning through discussion. Therefore, the exploration of all these ideas could be helpful in terms of what we might expect in an effective asynchronous discussion where the students could learn by expressing their questions, pursuing lines of inquiry together, teaching each other and seeing how others are learning. And finally these findings could proceed towards the exploration of the concept of computer supported collaborative learning.

2.2 The significance of distance education in today's Higher Education context

As it has been explicitly portrayed in the previous Chapter, powerful economic, demographic, and market trends are reshaping the landscape of Higher Education, particularly for adults. In the literature this fact is being reflected in numbers which show a significant shift from entrants into the job market of a predominantly 17-18 years old age range to a much wider range. In U.K there were 77,400 full-time, first year HE students over the age of 25 in 2000, but by 2001 this figure had reached almost 83,000 an increase of 7% (Catherall, 2005). Even the more recent statistical evidence suggested that the number of part-time students taking first degrees has more than doubled over a decade. In 2006-07, they accounted for 201,145 of those taking a first degree, compared with 89,670 in 1997-98 (The Guardian Report, Sep, 2008). Between 1994 and 1999 there was a 9% increase in the proportion of students in Australia who were studying full time, yet who were also in paid employment (McInnes, 2000). This change is also noted in the United States and other parts of the developed world in the form of what a study by Cunningham et. al., (2000) called the 'learner-earner'- the person with a full time job who undertakes study. According to Palloff and Pratt (2002) these non traditional students make up a rapidly growing population in education today and as their educational needs and demands are different from those of

traditional students, therefore it is these students to whom distance education is geared.

A second factor influencing distance education is that the Higher Education Institutions are undergoing a significant transition because of tremendous social and economic pressure. The mounting costs to run the institutes as well as the greater diversity among students have forced them to adopt coherent distance learning programmes.

In this context among the various modes of imparting a distance education programme, one approach would be very prominent, that is e-learning or electronic learning, i.e. learning by using the enormous power of technology. Generally, e-learning can be defined as "the use of technologies in learning opportunities" (HEFCE, e-learning strategy, March, 2005, p.5). In a wider sense, e-learning is a broad set of applications and processes which include Web-based learning, computer-based learning, virtual classrooms, and digital resources. Much of this is delivered via the Internet, Intranets, audio- and videotape, satellite broadcast, interactive TV, and CD-ROM. E-learning can cover a wide area of educational strategy because it is versatile. In practice e-learning refers to both wholly online provision and campus based or other distance based provision supplemented with ICT in some way. The supplementary model would encompass activities ranging from the most basic use of ICT through to more advanced applications. In recent times the general nature of the application of e-learning is much more focused towards project based and collaborative activities (Schneider et. al., 2002). Wikis, MOOs, Web-fora and blogs are all applications that can facilitate more interactive and creative learning environments in which students are obliged to 'enact' their understandings, to create and communicate their knowledge (Bruns and Humphreys, 2005). It is quite true that the definition of e-learning varies depending on the organization and how it is used but basically it involves electronic means of communication, education, and training (Alonso et. al., 2005).

According to the online advocates, the advent of electronic communications, the Web and the Internet and associated learning technologies have produced a climate in which e-learning is seen as a means towards improving Higher

Education learning and teaching (Garrison and Anderson, 2003; Laurillard, 2002; McConnell, 2000). Moreover as discussed earlier, due to the demand of the contemporary situation, new skills and competencies are needed as a result of a historical shift in work and life practices (e.g., Andriessen, Baker & Suthers, 2003; Bereiter, 2002). Castells surveys the many developments linked to the advent of electronic networks and concludes that the affordance of these electronic networks has the potential to develop a new form of global social organization, which he refers to as the 'Networked Society'. He concludes that this historical transition "calls into question the entire education system developed during the industrial era" and demands that we develop a new pedagogy based around the idea of learning to learn (Castells, 2001, p. 278).

The maximum productivity of digital technology as a unique form of educational technology can only be obtained if it is being used in those circumstances to bring changes in the nature of formal learning in ways that conventional methods cannot. In practice, it should be ensured that pedagogy exploits the technology, and not the vice versa (Laurillard, 2009). Furthermore, technology in itself cannot enhance the learning and teaching experience by increasing or improving student knowledge or motivation. Nor does it provide a 'magic' solution for the practicalities that staffs encounter within Higher Education Institutions, such as increased student numbers, limited teaching space, and a diversifying student population (Laurillard, 1993).

Recently Laurillard (2009) also reminded us that new technologies invariably excite a creative explosion of new ideas for ways of doing teaching and learning, although the technologies themselves are rarely designed with teaching and learning in mind. Therefore, to get the best from them for education we need to start with the requirements of education, in terms of both learners' and teachers' needs. Stahl, (2010) have also suggested that the use of learning technologies can only be effective if the curriculum, pedagogy and technology are skilfully planned, coordinated and implemented.

Therefore the concept of e-learning should no longer be based on a naïve belief that classroom content can be digitised and disseminated to large numbers of students with little continuing involvement of teachers or other costs, such as buildings and transportation (Stahl, 2010), as in this assumption the technology is

at risk of being used merely to enhance conventional learning designs, rather than generate designs that are much more effective and innovative (Laurillard, 2009).

Therefore, to ensure the optimal use of digital technology as a unique form of educational technology, it is important to evaluate the productive part of the pedagogical affordances of e-learning.

2.3   The pedagogic affordances of e-learning

A strategy is a broad brush depiction of plans - of what should be done to achieve certain objectives. A pedagogical strategy is directly concerned with action (Goodyear, 2005). Therefore like the versatile application of e-learning, there could be a versatile pedagogical approach aligned with the objective of using educational technology in a specific context. For example, the practitioners can use online course materials in Web supplemented courses to support two different pedagogical philosophies. The postings of content, such as slides, texts or videos can simply be used as the important resources for students, just as text books always have. In that case the pedagogical strategy is simply based on the philosophical belief of instructionism where the learners could be considered as the information receiver in the learning environment. However at the same time, in an interactive as well as motivational context, these contents can create an environment to support the fundamental philosophy of constructivism. Therefore the pedagogy of e-learning is dependent on how the individual practitioner has interpreted the concept of pedagogical philosophy; (about the nature of knowledge and competence, about how learning occurs, about how people should and should not be treated, etc.), as the application is always guided by the interpretation of the concept.

However a vast body of empirical research suggests that online teaching requires at least as much effort by human teachers as classroom teaching (Stahl, 2010). Not only must the teacher prepare materials and make them available by computer, the teacher must motivate and guide each student, through on-going interaction and a sense of social presence (Stahl, Koschmann and Suthers, 2006). The idea of using social interaction as the main pedagogical strategy in e-learning environment has motivated some researchers to use a new term 'networked

learning', as a distinctive version of e-learning approaches. Goodyear (2005) defined networked learning as:

> Learning in which ICT is used to promote *connections:* between one learner and other learners; between learners and tutors; between a learning community and its learning resources (Goodyear, Banks, Hodgson & McConnell, 2004).

The pedagogies of networked learning, naturally enough, emphasise the potential benefits of learning through collaboration with others; whether through online discussion, argumentation, group based investigations, apprenticeship, community action or other forms of joint work (Goodyear, 2002; Jonassen & Kwon, 2001; Koschmann, 1996; McConnell, 2000). This pedagogical approach stresses collaboration among the students, so that they are not simply reacting in isolation to posted materials. In this context, the learning takes place largely through interactions among students (Stahl, 2010).

Therefore, the fundamental pedagogical affordances of e-learning suggests that, the idea of teaching does not simply mean imparting decontextualised knowledge but the process must emulate the success of everyday learning by situating knowledge in real-world activity, by involving them in the learning process as much as possible. In reality the theoretical assumption behind this pedagogy supports the concept of constructivism in a sense that ideally the pedagogy wants to create such an environment where learners may work together and support each other as they use a variety of tools and information resources in their guided pursuit of learning goals and problem-solving activities (Wilson, 1996).

Therefore the constructivist principles, suggest that in order to build knowledge, learners need tools; these learning tools should enable students to carry out activities and to interact with each other (Jonassen et. al., 1995, p. 13). In the context of VLE (virtual learning environment), one example of a tool for learning is an asynchronous discussion system. This is a text-based computer communication tool which can support a variety of collaborative learning activities. The asynchronous nature of the communication means that collaboration can be distributed across time as well as across distance (Kear, 2004).

Therefore, from this perspective, if it is being considered that asynchronous online discussion has the potential to deliver a genuinely enhanced learning experience, it is desirable to analyse the new paradigm of teaching and learning more critically. However before embarking on the critical analysis of the asynchronous discussion forum as a potential platform to facilitate the new paradigm of teaching and learning, it is important to consider the general characteristic of learning mechanisms associated with learning through discussion.

2.4 Learning through discussion

As it has been documented in the article by Ellis et. al., (2004), in the field of Higher Education, the concept of 'learning through discussion' has been the focus of relatively early research into theories of learning (Pask, 1976), it has been identified as a characteristic of good teaching (Ramsden, 1992, p. 168), it has been closely associated with a quality approach to teaching (Trigwell & Prosser, 1996), and it is argued as an appropriate activity for quality learning in tutorials (Biggs, 1999, p. 86).

Furthermore, Ellis et. al., (2004) also commented that strategies underpinning the highest quality teaching approach, the approach that sought conceptual change in the students' understanding, fore grounded discussions as a way of helping the students engage with the content deeply in order to effect conceptual change (Trigwell and Prosser, 1996, p.82).

The pedagogical model of discussion-based activities is grounded on the assumption that knowledge can be constructed through social negotiation and that discussion with others—whether it may be peers or tutors—is a primary way to learn because it encourages critical thinking among the participants in general and hence develops understanding (Garrison et. al., 2001).

In their article, Rourke and Kanuka (2007), proposed that, from the empirical research findings, as Weedman (1999) has shown, few scholars, artists, or professionals can produce their work in solitude; they need the interactions, especially the exchange of ideas, and debate with their peers in order to develop their ideas. Similarly, in the educational domain, a wide range of scholars from their extensive research experiences, offer accounts of the role of discussion in a diverse set of outcomes, including cognitive development (Perret-Clairmont,

Perret, & Bell, 1989), higher-order thinking (Vygotsky, 1972), conceptual change (Chi, Bassok, Lewis, Reimann, & Glaser, 1989), emancipation (Mezirow, 1990), practical competence (Orr, 1996), epistemic development (Belenky, Tarule, & Goldberger, 1997), and understanding (Gadamer, 1989). Hence, discussion is a venerable learning activity in Higher Education (Rourke and Kanuka, 2007).

In practice, as Webb (1989) points out, explaining to others potentially offers even more opportunities for learning than explaining to oneself. Learning might take place not only due to one's own identification of missing knowledge, but also because the receiver of the explanation identifies further missing information, points out inconsistencies, requires further clarification or confronts the explainer with alternative points of view. In order to resolve these discrepancies, the explainer might search for further information, deduce and induce new information, or restructure already available information, and thus further learn about the domain under consideration. Therefore the general expectation is that, in the social learning settings, all these cognitive activities and mechanisms may occur more frequently than in individual cognition.

As highlighted by Kanuka and Rourke (2007), two decades of observation to measure the 'productivity' of discussion in Higher Education, indicate that students rarely engage in the communicative processes that comprise critical discourse and in the rare cases when they do, they do not achieve the purported outcomes (Veerman, Andriessen, & Kanselaar, 2000, Bonk & Cunningham, 1998; Bullen, 1999; Davis & Rouzie, 2002; De Laat, 2001; Gunawardena et. al., 1997; Gunawardena et. al., 2001; Jeong, 2004; Lopez-Islas, 2001; McLaughlin & Luca, 2000; Pena-Shaff et. al., 2001; Pena-Shaff & Nicholls, 2004; Rovai & Barnum, 2003; Thomas, 2002; Wilson, Varnhagen, Krupa, Kasprzak, Hunting, & Taylor, 2003; Yakimovicz & Murphy, 1995, Lipponen et. al., 2001, Jakobsson, 2006). Therefore, these findings clearly suggest that in most of the cases this pedagogical approach has been used in an unproductive way.

According to the concept of productive learning there should be clear measureable relations between processes and products, so the critical emphasis should be put on measuring the transformation and reorganisation of knowledge as the main advantage of the process of discussion, not just the replication and reproduction of knowledge. Therefore, the quality of the interactions constituting the learning process is a crucial factor of productive learning environments; in particular the

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intersubjective use of writing and talk as mediating tools (Lillejord and Dysthe, 2008).

It is worth noting that in everyday language, dialogues may be anything from 'mere talk' to profound learning experiences. However, there could be two general configurations of the role of online discussion in Higher Distance Education (Kanuka and Rourke, 2007). The first set is 'dialogical', where the themes are evolved from the ideas developed by Bakhtin (1981). The learning environment, based on 'dialogical model' should consist of three different dialogic levels. The first dialogic level could be authoritative (Bakhtin, 1981), as it mostly consists of conceptual and intellectual re-productions. These dialogues are characteristically monological (Rommetveit, 2003). The second dialogic level could represent a situation where various voices can be heard and is increasingly developed towards a persuasive discourse. In this particular form of discourse, the students' utterances partly consist of their own words and voices and partly of other's (Bakhtin, 1981). In the third dialogic level, the active understanding also becomes increasingly dialogical and the voices develop from being authoritative and monological to increasingly persuasive and active. In this situation, the dialogues often succeed in making the meaning potentials explicit and visible, which in turn create increased prerequisites for the students to use them as a basis for learning and development to a higher degree than before (Rommetveit, 2003).

The second set of models is 'dialectical'. Similarly from the 'dialectical' perspective, the critical discourse should be composed of a thesis-antithesis-synthesis structure, where one student proposes her analysis of a course reading, a second student offers a counter-proposal, and through reasoned, reflective discussion, they come to a more sophisticated, higher-level synthesis (Rourke and Kanuka, 2007). The root of this model is fore grounded in the socio-cognitive conflict theory (Doise & Mugny, 1986; Perret-Clairmont et. al., 1989) which is fundamentally originated from the Piaget's (1977) cognitive conflict theory.

However, the drawback of this pedagogical approach (i.e. the learning through mere discussion) is that according to Piaget's theory of constructivism, individual cognitive systems are open to potential revision and refinement, changing via differentiation and integration. In the social learning environment, the accommodation of the multiple perspectives presented by the other participants opens up the possibility for revisions of the cognitive system. For the cognitive

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system to be revised, gaps in meaning making and perturbations must be incorporated into it. This incorporation only leads to revision of the cognitive system, which might be categorised as the co-construction of new knowledge. However participants are often only momentarily aware of gaps or perturbations and do not take the next steps of trying to incorporate them into the present cognitive system. In this case change does not occur; therefore the co-construction cannot happen. A similar theoretical model has been proposed by Vygotsky (1978), where the phase of co-construction can only be achieved after the process of internalisation as an effect of social scaffolding in the practice environment. Therefore in case of socio-cultural learning, it is quite easy to get an impression that the participants have made an attempt to co-construct something as part of the mutual negotiation; however it is difficult to measure whether the participants have changed their perspectives on a permanent basis or not.

Therefore, the productivity of the interactional process could either be measured if the participants explicitly provide the evidence of the co-constructed knowledge through their utterances, or if the sociocultural environment includes the aspect of formalising or objectifying the collaborative knowledge that the group members have developed through the process of discussing alternatives, clarifying meanings and negotiating perspectives among them.

This assumption calls for the critical evaluation of the idea of collaborative learning, and the overall concept of computer supported collaborative learning (CSCL) which can be executed through the thoughtful application of asynchronous online discussion.

2.5 Asynchronous computer mediated interaction and the new paradigm of teaching and learning

In recent years some distance courses have adopted more advanced Web technologies, such as Voice over IP or audio-graphic virtual learning environments (Hampel & Hauck, 2004), the preponderant model is still asynchronous computer-mediated (ACM) conferencing. Unlike synchronous forms of online communication, which require real-time online participation, the asynchronous mode of communication provides the flexibility required by many distance learners in that they can log on to the system to participate in a

conference at any time (Hopkins et. al., 2008). As a consequence asynchronous computer mediated interaction is unlikely to be completely replaced by synchronous forms of online communication in the foreseeable future.

Computer-mediated communication (CMC), mainly the asynchronous mode has greatly influenced teaching practice and the learning experience encountered in Higher Education. Because of several advantages, like broader access to the internet, increasing learner demand for flexible delivery, pedagogical paradigms that emphasise self-direction and learner autonomy, along with ever-increasing student-staff ratios have seen the wider incorporation of CMC within Higher Education curricula (Ramsay, 2005). Harasim [1997, p.121] defines computer conferencing as "a group communications medium enabling groups of people to exchange ideas and opinions and to share information and resources." As one study indicates (Berge and Collins, 1995), the benefits of computer conferencing include convenience, place-independence, time-independence, and the potential for users to become part of a virtual community. While describing the benefit of asynchronous online discussion, Phillips and Santoro (1989) have commented that asynchronous communication is useful as it can provide a rapid way to transfer questions and answers and seems to facilitate participation.

Pena-Shaff, Martin & Gay's (2001) study, for example, has found that:

> Asynchronous [CMC] discussion environments increased the opportunities for participants to develop sophisticated cognitive skills such as self - reflection, critical thinking and in-depth analysis of the course content, supporting the purposeful construction of meaning. The need to articulate one's own argument in this type of text-based environment encourages students to engage in analytical and reflective action. This process helps students construct purposeful arguments and transmit them to an audience. (p. 65).

According to the literature an important characteristic of online interactivity is open access to the floor, leading to multidirectional conversations which contrast with the teacher dominated unidirectional discourse of traditional classrooms (Harasim, 1999; Hiltz, 1986; Schallert et. al., 1999; Stacey, 1999). Some studies show that while traditional classrooms may contain up to 80% of teacher talk

time, online discussions often contain instructor contributions of only 10 to 15% (Harasim, 1987; Winkelmans, 1988 cited in Harasim 1989).

As Pavey and Garland (2004) suggest, VLEs also provide 'the potential to stimulate depth of learning by encouraging students to engage more fully with the topics and issues' (p.305). They also suggest that levels of interaction within the student community are increased as more students are able to participate than in conventional classroom formats, and 'less-confident' students can contribute in an 'unthreatening environment' (p. 306). Laurillard (2002) cited evidence where in a computer conference running during an Open University course showed that the average length of student contribution was 200 words, equivalent to over one minute of continuous speech, which is really rare for a student contribution in the standard face-to-face tutorial.

Because of the advent of technology, during asynchronous discussion, the availability of the messages of a threaded discussion in an online learning environment provides a much wider scope for a deeper level of discourse. In the online classes the participants communicate via written text. The written word serves best to mediate recall and reflection. Participants read, actively choosing nonlinear pathways through online texts or hypertexts, thus constructing their learning experience by choosing what they will read and in what sequence (Henry & Worthington, 1999). Bangert-Drowns (1997) says "literate thinkers build personal knowledge through exploration of meanings in transactions with texts" (p.2). The potential for conceptual growth is facilitated by the learning focused textual environment of CMC not only because of immersion in reading meaningful texts but conference participants express themselves in writing (Harasim, 1993). The nature and quality of interactive writing itself bootstraps the construction of meaning. By working collaboratively, learners investigate alternative perspectives and ideas. Jonassen (1996, pp. 176–177) writes that a tool such as an online discussion forum is 'a naturally collaborative technology. It fosters collaborative meaning making by providing multiple perspectives on any problem or idea'. Therefore, Aviv et. al., (2003), claim that a well-structured asynchronous learning environment contributes greatly to the development of an individual's reflective dialogues and critical analysis.

It is important to note that in the above mentioned references, the term 'collaborative learning' is probably not always used in that restrictive sense of

today's precise definition of collaborative learning, according to which collaboration is a coordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of a problem (Roschelle and Teasley, 1995). The exploration of research in the specific field of computer supported collaborative learning (CSCL) has differentiated the overall concept of collaboration from the general idea of socio-cultural learning (like Stahl, 2005, Laurillard, 2009). Therefore, the use of the term 'collaboration' in a general sense often just refers to the overall idea of learning within a social context (i.e. the socio constructivist principle of learning), without differentiating the approach from any another possible strategy like cooperative learning.

From a different perspective, in the case of asynchronous communication, because of the lack of physical presence and the absence of many of the usual face-to-face cues to personality, there is an initial feeling of anonymity, which allows students who are usually shy in the face-to-face classroom to participate in the online classroom. This same feeling of anonymity creates some political differences such as more equality between the students and instructor in an online class. The lack of a face-to-face persona seems to disarm the lecturer of some authority. Students feel free to debate intellectual ideas and even challenge the instructor. Therefore, it has the potential to provide a non-intimidating environment where learners feel able to give opinions, offer suggestions, and ask questions (Alvarez-Torres, 2001). Both teachers and learners thereby become equal participants in the discussion, and participants do not have to wait for their turn or for the teacher to invite them to contribute (Alvarez-Torres, 2001).

Therefore, as far as the affordance of the medium is concerned, the electronic conference can provide the ideal space for self-paced, active and collaborative learning "in a peer-support and exchange environment" (Hiltz, 1994, p.12). And this affordance could be helpful to design the associated pedagogical approach based on dialogue, debate and conversational learning with access to other students' experiences and opinions (Mason and Kaye, 1989).

In a nutshell, the pedagogy of asynchronous online discussion is based on the theoretical framework of social interaction, where the assumption is students can learn in the company of others through the mutual negotiation of the subject matter. Now at this point it is vital to consider how the conventional approach of

socio-cultural learning can be transformed into productive collaborative learning in the context of asynchronous discussion.

2.6 Computer supported collaborative learning

While introducing the general concept of computer supported collaborative learning, Stahl (2006) proposed that the ubiquitous linking of computers in local and global networks makes possible the sharing of thoughts by people who are separated spatially or temporally. Brainstorming and critiquing of ideas can be conducted in many-to-many interactions, without being confined by a sequential order imposed by the inherent limitations of face-to-face meetings and classrooms. The whole mechanism can facilitate the formation of small groups engaged in deep knowledge building. It can empower such groups to construct forms of group cognition that exceed what the group members could achieve as individuals.

In this context, it is important to mention that in the literature, conscious efforts have been made to distinguish CSCL from the earlier investigation of group learning, especially to draw a distinction between co-operative and collaborative learning. According to Dillenbourg (1999), in case of co-operative learning, partners split the work, solve sub-tasks individually and then assemble the partial results into the final output, whereas in the case of collaboration, partners do the work 'together'. He then extended the proposition by referring to the definition of Roschelle and Teasley (1995), which implies that, collaboration is a process by which individuals negotiate and share meanings relevant to the problem-solving task at hand.... Collaboration is a coordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of a problem.

In order to make a distinctive differentiation between the cognitive processes involved with these two approaches, Stahl (2005), proposed that in cooperation the learning is done by individuals, who then contribute their individual results and present the collection of individual results as their group product. Learning in cooperative groups is viewed as something that takes place individually. By contrast, in Roschelle & Teasley's (1995) characterization of collaboration, learning occurs socially as the collaborative construction of knowledge. Of

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course, individuals are involved in this as members of the group, but the activities that they engage in are not individual learning activities, but group interactions like negotiation and sharing. The participants do not go off to do things individually, but remain engaged with a shared task that is constructed and maintained by and for the group as such.

In the recent paper Laurillard (2009) has made an attempt to differentiate between socio-cultural learning and collaborative learning. She proposed that socio-cultural learning prioritizes the value of discussion with peers as an aspect of learning as it recognises the value of having to articulate an idea, and to negotiate in the continual iteration of discussion. The reciprocal dialogic process of question-answer, or thesis-antithesis, or point-counter point could be the productive part of sociocultural learning as it is illustrated in Fig.2.1. However as it is depicted from this presentation, there is no option to externalise the mental representation of knowledge through tangible artefact as the further discussion around the artefact shapes and sharpens the students' ideas.

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Fig. 2.1: Socio-cultural learning (Laurillard, 2009, p.10)

Laurillard argues that collaborative learning combines the additional concept of constructionism with social learning. The value of this addition is its clarification of the opportunity that learners have to share and discuss the actions they take, and the products they make, in the practice environment. In fact, this idea of constructionism helps us to understand how ideas get informed and transformed when expressed through different media, when actualised in particular contexts,

when worked out by individual minds (Papert, 1991). The major advantages of this form of constructionism could be that in this approach the internal meaning making process can be expressed through some tangible and shareable outcome which in turn can be modified for a richer solution/production through the communication with others.

Considering the advent of networked personal computers, Stahl et. al., (2006), describe Web-based learning as a collaborative process in which participants can negotiate and share meanings within a larger motivational and interactive context. They consider the learning environment as a knowledge-building practice that is mediated by technically designed artefacts. Stahl and Hesse (2007) clarify the phenomenon further through arguing that people develop new knowledge and insights through collaboration in a learning community in which participants are involved in creating interpersonal meaning. According to their proposition, the asynchronous dialogues thereby become a conversation in which participants are mutually dependent on each other since those who write and those who read are co-authors and shareholders in a common negotiation to develop a meaning and understanding of the course content.

Moreover, the goal of collaborative knowledge building is much more specific than that of e-learning or distance education generally, where computer networks are used to communicate and distribute information from one teacher to several students who are geographically dispersed (Stahl, 2006). Collaborative knowledge building stresses supporting interactions among the students themselves, with a teacher playing more of a facilitating than instructing role. Moreover, knowledge building involves the construction or further development of some kind of knowledge artefact. Stahl (2006) has represented the overall idea through the following diagram (Fig.2.2).

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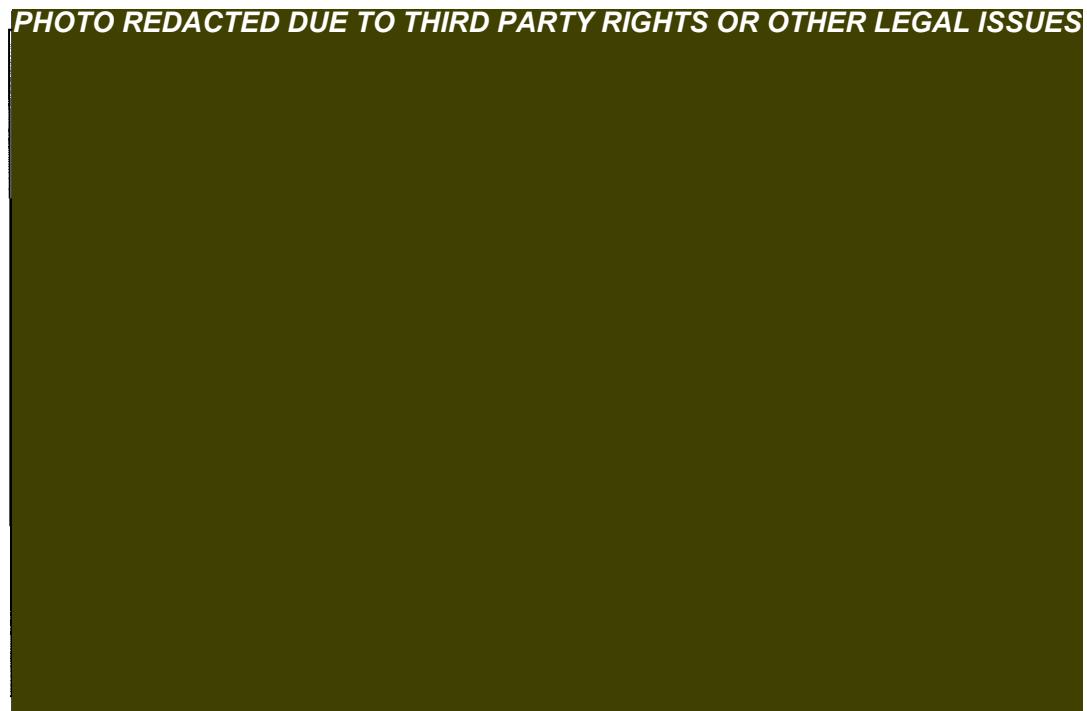
Fig. 2.2: The diagram of collaborative knowledge building processes (Stahl, 2006, p.195)

According to Stahl (2006), from a cognitive viewpoint, there are many skills and sub processes at work that are not represented in the diagram. For example, the activities considered as personal skills, like summarisation, text understanding, critical thinking, logical structuring of arguments, even the social interaction skills such as turn taking, repair of misunderstandings, rhetorical persuasion, interactive arguing are completely ignored in this diagram. However this highly selective illustration can convey the message that in effective collaborative knowledge building, the group must engage in thinking together about a problem or a task, and should produce a knowledge artefact or a more developed theoretical analysis that integrates their different perspectives on the topic and represents a shared group result that they have negotiated.

In terms of the mechanism of collaborative interaction, this diagram clearly shows that the process of collaborative interaction starts with the tacit pre understanding of the participating individuals. The nature of tacit knowledge could be varied from the ability to use certain physical tools or unstated background knowledge about the world, about other people and other objects referred to in discussion (Stahl, 2005). According to this model, in collaborative knowledge construction, these tacit meanings are made explicit, clarified and negotiated in an interpretive process, and a shared understanding of them is created as a result of this process, which has been termed as 'collaborative knowledge'. In practice from the

theoretical proposition of this model, the production of collaborative knowledge can be considered as the accomplishment of the first part of the collaborative discourse where the individual cognitive systems interact with each other for the further refinement of the initial understanding, resulting in the production of accumulative knowledge in the group space. However the way the knowledge building mechanism has been portrayed in this diagram, it clearly implies the fact that in order to assess the precise effect of collaborative interaction on each and every participating individual, it is necessary to consider the resultant outcome of the interaction where it produces a shared artefact, representing the understanding of the group as a single entity. As a consequence, to complete the process of collaboration, it is essential to formalize or objectify the collaborative knowledge through the production of a shared artefact. From the research point of view this fundamental characteristic of the collaborative knowledge building process is the main assessment criterion to be met before labelling the practice situation as a collaborative one.

The whole interactional process (represented in Fig.2.2) can help to develop the concept of 'group cognition' that exceeds what the group members could achieve as individuals. According to the core conceptual idea of group cognition, groups construct knowledge that may not be in any individual minds, but may be interactively achieved in group discourse and may persist in physical or symbolic artefacts such as group jargons or texts or drawings (Stahl, 2005).

In general, collaborative knowledge building itself can be viewed as fundamentally a knowledge negotiation process. Proposed statements of knowledge by individuals are subjected to collaborative interactions, whereby meanings of terms are clarified, alternative related statements are compared, linguistic expressions are refined, warrants are scrutinised and so on (Stahl, 2006). Therefore it is quite logical to say that the whole collaborative knowledge construction process may have more to do with the socially mediated processes of conflict resolution, as opposed to just developing cognitive conflict through social interaction. Therefore the collaborative knowledge is a social product which results from a complex interaction among the group participants involving the individual (psychological) and group (social) processes in the social plane. The collaborative knowledge is something that the group creates that cannot be attributed to the mental processes of any one individual. While describing the

attributes of collaborative knowledge Scardamalia and Bereiter (2006) proposed that a description of the state of knowledge is not about what is in people's minds at all. In fact, if we look back at prehistoric times, using archaeological evidence, we can make statements about the state of knowledge in a certain civilization at a certain time, without knowing anything about any individuals and what they thought or knew.

Therefore for the transformation of the mere asynchronous discussion into the productive collaborative one, the whole learning environment should foster the concept of 'purposive relationship', the intent of which is to 'produce something', to solve a problem, create, or discover something' (Schrage, 1995, 29), and to work together to achieve shared goals (Kaye, 1992; Roschelle and Teasley, 1995).

According to Dillenbourg (2002), the empirical studies on collaborative learning show that the effectiveness of collaborative learning depends upon multiple conditions such as the group composition (size, age, gender, heterogeneity ...), the task features and the communication media. However, these conditions are multiple and interact with each other in such a complex way that is not possible to guarantee learning effects. From the research perspective, rather than considering the conditions that could indirectly determine the group interactions, it is much more desirable to focus on the direct conditions. Dillenbourg proposed that collaboration can be influenced anticipatively, by structuring the collaborative process in order to favour the emergence of productive interactions, or retroactively, by regulating interactions, as tutors do.

Therefore from this point of view, it is quite evident that to achieve the optimal benefit of collaborative interaction, there is a need for instructional support that guarantees a higher quality of both collaborative learning processes and individual learning outcomes (Kollar et. al., 2006).

2.7 Factors affecting collaborative learning

It is important to define the pedagogical challenges to technology, if the CSCL community is to drive the technology towards what learners need, rather than simply trying to exploit what the business and leisure market create (Laurillard, 2009). Considering this perspective, it is necessary to conceptualise collaborative

learning not as a simple method, because of the low predictability of specific types of interactions; rather a 'collaborative' situation is a kind of social contract, either between the peers or between the peers and the teacher (Dillenbourg, 1999). This contract specifies conditions under which some types of interactions may occur.

Using a CSCL environment is no guarantee of productive student interaction or positive effects on learning. Studies in this field (e.g. Scardamalia and Bereiter, 1994; Stahl et. al., 2006) often assume that participants are automatically able to use collaboration as a tool for learning and knowledge development when they are involved in Web-based learning. However, other studies (e.g. Lipponen et. al., 2001; Lindberg and Olofsson, 2005; Jakobsson, 2006) reveal that students are not always active participants in these environments and that the outcome tends to result in relatively superficial or unreflective reproductions.

Referring to the evidence from the literature, Kollar et. al., (2006) suggested that research on collaborative learning repeatedly demonstrated that learners often do not collaborate well spontaneously (Cohen, 1994). In most of the cases, they tend not to participate equally (Cohen and Lotan, 1995), often engage only in low-level argumentation (Bell, 2004), and rarely converge on a comparable level of knowledge acquisition (Fischer, Bruhn, Gräsel, & Mandl, 2002).

As proposed by Dillenbourg (1996), collaboration works under some conditions. One of the prime conditions to establish the effective collaboration is dependent on the fact of maintaining the group cohesion, as in this process the community of participating individuals should have a shared objective and shared approach to accomplish the collaborative task. However, in a heterogeneous group it is quite challenging to establish that 'shared' principles because of the several issues. For example, as it has portrayed by Hughes (2010), issues of identity and belonging to the institution or programme or discipline are very important for retention (Read et. al., 2003), and possibly this sense of belonging might also explain why not everyone takes a full part in e-learning, and why some, and not others, are willing to persist with new and unfamiliar technologies and challenging ways of working collaboratively.

According to Palloff and Pratt (2001), in the computer mediated classroom, as it is configured currently, instructors and students are mainly presented by text on a

screen. The missing part is the participants cannot see the facial expression and body language that help us gauge responses to what is being discussed. They cannot hear voices or tones of voice to convey emotion. Consequently, it is really difficult for some students to establish a sense of presence online. In face-to-face situation, people are able to convey in a multitude of ways that we are as people. However in the virtual learning environment the instructors and their students become, in effect, disembodied. As a consequence, not all learners find the textual communication with unseen persons useful and fulfilling (Bayne, 2004), and many do not feel they have a social presence online (Gunawardena & Zittle, 1997). For example, Sproull and Kiesler (1991) talk about the difficulties that distributed work groups have in achieving consensus when no face-to-face contact occurs. They state,

> When groups decide via computer, people have difficulty discovering how other group members feel. It is hard for them to reach consensus. When they disagree, they engage in deeper conflict (p.66).

And even Ian Macduff (1994) in his article on electronic negotiation, states that there is greater potential for conflict to emerge in electronic discussion than in face-to-face discussion due to the absence of verbal, facial, and body cues and to difficulty in expressing emotions in a textual medium. This may result in unfamiliarity among group members, which can lead to deficient group dynamics (Fung, 2004). Online collaborative groups may also go through delayed group developmental stages, taking longer to develop social relationships (Fung, 2004; Johnson, Suriya, Yoon, Berrett, & Fluer, 2002). Similarly, in Vonderwell's (2003) study, some students worried about communication problems they might encounter since they did not see each other face-to-face. These included delayed response and unfamiliarity with classmates. Kim, Liu, and Bonk (2005) reported that the difficulty of communication was one of the key barriers among peers because of learners' time zone differences and the absence of face-to-face meetings. Difficulty with communication can be particularly challenging for groups working online, where delays and not having a sense of knowing the group members can have a clear impact on group performance.

From the perspective of 'community of practice' Wenger emphasises that community members need to move on identity trajectories which align with the goals negotiated by the community to become a situated learner in that

community (Hughes, 2010). However, this identity must be reconciled with other community memberships and identities to form a complex and personal sense of self. However this process of congruence between the individual and the group identity can be affected by the various factors depending on the characteristics of the individual learner influenced by cultural issues or the technical assess or individual motivation.

For example, in a multicultural online environment, there could be so many students who are unfamiliar with the new approach of learning, and students sometimes assume that taking an online course is the softer, easier way to earn credit (Pall off and Pratt, 2001). They learn quickly however, that this is not the case. But the problem is this sort of misconception leads to large number of drop outs. Moreover in the virtual learning environment where the students' population has a diversity of educational needs and that students vary greatly in their ability to perform as self-directed students. For instance, some students lack confidence in their academic abilities and need more individual attention (students accustomed to traditional methods of instructivist teaching-learning may find it hard to adapt to activate and innovative learning techniques) while other adult students are highly autonomous and have different kinds of academic needs.

Similarly learners from different cultures seem to exhibit different patterns in their online interactions with their teachers and peers. For example, Jager and Collis (2000), note that in some cultures it is normal to criticise others whereas in other cultures it is not. One interesting research finding has been highlighted by Hudson et. al., (2006), while working in a project for International Masters programme in E-learning Multimedia and Consultancy; they observed that in the threaded discussion there was always a tension between the Dutch and English students. In most of the cases the English students became offended because of the style of writing of their Dutch counterpart. This finding clearly highlights that there are cultural differences between British and Dutch in dealing with each other. British in being very polite in giving their opinion and Dutch being very direct and come to the point and thus may be a bit blunt. In line with that Liang and Mc Queen (1999) found that the learners from Asian and Western cultures differed in their expectations about the role of tutors and their learning styles. Most of the Asian students had been tutor oriented learners in their native countries and tended to rely heavily on direction from their teachers even in the interactive online learning

environment. In contrast most of the Western students tended to be peer-oriented learners who believed that more interaction among students should be encouraged.

To overcome these potential problems, social interaction is important for online group work as it can impact students' perception of collaboration and social presence. Social interaction plays a role in enhancing student learning and satisfaction with online courses. Social interaction is also affected by features of the online learning environment, individual learners' characteristics, and instructors' pedagogical strategies. In turn, social interaction may impact group formation, group dynamics, and the building of group structures (Kreijns, Kirschner, Jochems, & Van Buuren, 2004). Understanding how these elements work together during group work in an online context is important for facilitating learning. Some researchers have sought to identify strategies to make the social interactions that occur in online group work more explicit. For example, the framework proposed by Kreijins et. al. (2004) suggests that relationship sociality, social presence, pedagogical technique, and interaction are important aspects for facilitating group work in an online context. Groups must be properly formed and managed; students must be made accountable for their own and group learning; group assignments must promote learning and team development; students must have a frequent feedback (Crosta &McConnell, 2008). According to Michaelsen (2004), particular attention should be paid to assignments. Indeed most of the problems arising while learning in group are related to inappropriate assignments, so that instead of requiring truly group interaction and work, they require just individual sharing of tasks and roles.

Furthermore, there is a complex interplay between the participants' technical access and skills and the motivation to be active online. For example, Chmielewski (1998) found that males have significantly more knowledge of the web, and use the web more often than females. Arbaugh (2000), however, found that men (n=14) relative to women (n=13) reported more difficulty *interacting* in an asynchronous internet-based MBA course, which was also a significant predictor of class participation. Some research has confirmed this with people over the age of 55 reportedly using the web significantly less than any other age group (Chmielewski, 1998). In a survey of domestic web use in middle-aged (aged 40–59 years), young-old (aged 60–74 years), and old-old adults (aged 75–

92 years) Morrell, Mayhorn, and Bennett (2000) confirm that there are distinct age differences in individuals who use the web with the oldest adults showing the least interest in using the web. These survey findings clearly highlights that there could be significant difference in terms of the familiarity, in terms of different technological applications or the technological competencies as far as the age or gender is concerned. Therefore, ensuring the security and reliability of the technological environment is important for online group work, since this will enable smoother interactions. In addition, helping students feel comfortable with the system and with the software that they are using will also assist with the online interactions of the group (Hwa Koh and Hill, 2009).

However, in this research as a conditional paradigm (the conditions under which collaborative learning is efficient), 'group heterogeneity' is not the topic of interest, rather the focus is to explore the effect of task design and the involvement of the tutor to achieve the desired outcome of collaborative interactions.

According to Dillenbourg (2002), collaboration can be influenced anticipatively. In practice two complementary approaches can be assumed. By structuring the collaborative process (the instructional design like collaborative script) in order to favour the emergence of productive interactions. Or retroactively, by regulating interactions (i.e. the regular intervention by the tutors to guide the discussion).

Therefore, for structuring effective collaborative interactions, a sequence of tasks with defined objectives can keep the students focused, and thinking at the right level. For example, according to Jones and Asenio, 2001; there is a strong relationship between task type and learning outcomes, which suggests that certain types of task will promote learner interaction and the social construction of knowledge more than others. According to some empirical work and analysis, minimally-structured problem solving rarely leads to productive learning outcomes (Fischer et. al., 2007; Kirschner et. al., 2006). Dillenbourg (2002) proposed that free collaboration does not systematically produce learning. One way to enhance the effectiveness of collaborative learning is to structure interactions by engaging students in well-defined scripts. A collaboration script is a set of instructions prescribing how students should form groups, how they should interact and collaborate and how they should solve the problem. In other

words, a script is a more detailed and more explicit didactic contract between the teacher and the group of students regarding to their mode of collaboration.

Therefore from the practical viewpoint it might be expected that for the collaborative construction of knowledge, the learners need specific types of instructions for completing the task. In the study of Hathorn and Ingram (2002), two groups of students were told to collaborate on a solution and the other two groups were told to select roles and discuss the problem from different points of view. The findings revealed that those groups instructed to collaborate were in fact more collaborative. However in this context it is important to mention that this research also found that the collaborative group produced a solution of a lower quality than the other groups. It suggests that the instruction for collaboration could be considered as a guideline for the co-construction of knowledge, but the guideline cannot provide any guarantee for focusing and refining discussions so that the conversation progresses beyond information sharing to knowledge construction. The empirical study by Paulus (2005), points out that putting student in groups to work on set tasks does not necessarily lead to collaborative interactions.

In terms of task design, Garrison and Cleveland-Innes (2005) stress the importance of defining clear expectations. Fundamentally, a clear formulation of the purpose of the task appears to be particularly helpful to learners. In an analysis of ACM conferences where foreign-language learners were encouraged to reflect on their learning, Lamy and Hassan (2003) found that making learning aims explicit to participants was more important for achieving the intended outcomes than the detailed structuring of a task.

However, despite careful task design and clear learning aims, the literature suggests that there can still be problems of interpretation in terms of how students understand what is expected of them. For example, Jones and Asensio (2001) found that students' interpretations of their common set tasks varied within the group. This issue is therefore likely to have implications for the way in which students plan to coordinate their work and collaborate with one another in order to complete the tasks.

Therefore the task design is one of the significant factors in determining the success of collaboration. The careful design of certain effortful cognitive activities can increase the probability of collaborative interactions.

It can be quite challenging to understand how to achieve effective collaboration: how often to use deadlines, how detailed instructions should be, and how far participants should be encouraged or enforced (Jones and Asensio, 2001). Strijbos, Martens, and Jochems articulate this dilemma:

> An unresolved issue is when, how, and what kind of pre-structuring is used to support interaction. Too much structure may result in 'forced' artificial interaction, but no structure may result in fragmented interaction or a situation where interaction could be seen as an optional activity instead of an essential process. (2004, p. 412).

Similarly, there is no guarantee that the discussion around the well-defined tasks should be resulted in the construction of a joint understanding. For example while defining the negative side of script; Dillenbourg (2002) has explicitly mentioned that scripts may lead to introduce fake collaboration. Occasionally scripted interactions may appear like a negotiation but under the surface, lack of any reason for the learners to negotiate meanings. Learners may ask scripted questions as they repeat a song, without convincing the explainer that his explanation is needed. Furthermore, scripted collaboration may appear superficially as genuine collaboration, but may fail to trigger the cognitive, social and emotional mechanisms that are expected to occur during collaboration.

Therefore, in the collaborative environment there should be certain mechanisms to ensure effective collaborative interactions. Possibly for the constant iterative cycle of communication in a collaborative learning environment the learner also needs intrinsic feedback on their actions. Intrinsic feedback, if the response is incorrect, sets up the cognitive conflict between their expectation and the outcome of their actions, and thereby creates the opportunity to reflect on the process and revise their actions. It can also create other cycles of iteration among the learners as they could be interested to discuss their previous actions in order to improve their revised one. This whole process can motivate the further development of the learner's conception and its application in practice (Laurillard, 2009). In these circumstances for the effective collaboration the tutors' role should be to:

- Summarize the whole discussion from time to time,
- Span wide ranging views,
- Introduce fresh strands of thought and,
- Suggest alternative approaches. (Salmon, 2003).

Or in other words, Ryan et. al.,, (2000) suggest "The main role of the online tutor is that of educational facilitator:

- To contribute specialist knowledge and insight,
- Focus the discussion on the critical points,
- To ask questions and respond to student's contributions, weave together disparate comments and synthesize the points made to foster emerging themes" (p.110).

Ryan et. al.,, add that tutors also need skills for nurturing online collaboration, creating an atmosphere of openness, assuring all participants that their contributions are valued and welcome, building rapport within the group to help members to explore ideas, different perspectives and to take ownership of their learning.

Similarly Anderson et al (2001) highlighted that,

> ... this subject matter expert is expected to provide direct instruction by interjecting comments, referring students to information resources, and organizing activities that allow the students to construct the content in their own minds and personal contexts. (Anderson et. al.,, 2001, p. 9).

This multiplicity of recommendations for the role of the e-tutors in the learning environment clearly signifies that apart from providing the structured activities, during the collaborative interactions the students should be guided to respond and participate in a manner from which they derive optimum benefits. The tutors' actions, like summarizing the whole discussion from time to time, span wide ranging views, introduce fresh strands of thought and, suggest alternative approaches, are seemed critically important in the development of overall collaborative knowledge through the process of higher order cognitive mechanisms of the participating individuals. However, in this research attention should be paid to exploring how teachers could be integrated into the process of collaborative knowledge development and which role they should take to facilitate the philosophy of collaborative learning as opposed to replicate the mechanism of

traditional instructivism. Or in other words, the research objective should be guided to investigate the tutors' initiation to refashion the existing pedagogy of education in such a way, so that it becomes a coherent effort to encourage students to be a part of knowledge creating culture (Scardamalia and Bereiter, 2006).

However, in this context it is also important to recognize that apart from these two factors i.e. the task design and the role of the tutor in the learning process, there could be another significant consideration that could have an influential impact on the successful accomplishment of the collaborative process. That consideration would be the challenging issues of maintaining the group cohesion, necessary for the collaborative learning.

2.8 Summary of literature review

From this literature review, it is clear that,

- The concept of computer supported collaborative learning has emerged in the field of e-learning in order to ensure the collaboration/ interaction among the students, so that they are not simply reacting in isolation to posted materials. In this approach, the learning takes place largely through interactions among students. Students learn by expressing their questions, pursuing lines of inquiry together, teaching each other and seeing how others are learning (Stahl, Koshmann and Suthers, 2006).

- The collaborative learning approach covers more than is addressed in the perspective of socio-learning theory. It also embraces the idea of 'constructionism'. According to the theoretical assumptions of collaborative learning it is not enough to measure how one cognitive system is transformed by messages received from others, as the most important criterion is to evaluate how these cognitive systems merge to produce a shared understanding of the problem.

- One of the major factors influencing the success of collaboration in asynchronous online discussion could be the role of the e-tutors in the overall learning environment.

In practice this summary is the fundamental basis on which the research questions could be formulated subsequently.

2.9 Formulation of research question

From this extensive literature review, we can conclude that asynchronous collaborative discussion is more than interaction, and the whole learning environment should foster the concept of 'purposive relationship', the intent of which is to 'produce something', to solve a problem, create, or discover something' (Schrage, 1995, 29), and to work together to achieve shared goals (Kaye, 1992; Roschelle and Teasley, 1995). Therefore, from the practical perspective, it is quite easy to label any asynchronous discussion-based learning environment as a 'collaborative' one. But incorporating all these theoretical parameters into practice is a huge challenge for the tutors.

As mentioned earlier, not only do people need access to a great deal of information, they must also be able to use higher order learning skills, cognitive flexibility and effective cognitive strategies so as to translate their knowledge into 'effective action in the domain of existence' (Maturana and Varela, 1992). And this demand has influenced a radical shift from the 'transfer of knowledge' paradigm toward a paradigm that Bruner (1996) has described as the learner as thinker (De Laat et. al., 2001). Based on this new professional discourse in education, within the boundary of collaborative asynchronous discussion, it could be expected that, the pedagogy should focus on the subjective character of knowledge construction as a result of students' individual knowledge and strategic experiences and their interpretations of the world around them (based on the perception of learner as thinker paradigm suggested by Duffy & Knuth, 1991; Cunningham, 1992; Spiro & Jehng, 1990).

Therefore, in order to assess the productivity of this new and so-called more effective operational practice of asynchronous online discussion this thesis sets out to evaluate critically,

- **To what extent is the current use of asynchronous online discussion environments based on the principles of collaborative learning?**

And

- **How far is**

(i)   **the task design, and**

(ii) the role of the tutors, responsible for effective collaboration?

Chapter three: Theoretical perspective of research design

3.1 The collaborative learning framework

The theoretical framework demands a solid rationale. In examining a specific setting or set of individuals through the theoretical perspective, the researcher could show how he/she is studying a case example of a larger phenomenon. By linking the specific research questions to larger theoretical constructs, the researcher can show that the particulars of the study serve to illuminate larger issues and therefore hold potential significance for that field.

In this empirical research, without a theoretical model of the collaborative learning process, it is impossible to identify empirical indicators that will form the basis of a coding instrument as a standard against which to evaluate whether or not effective learning is occurring in the online discussions (Gunawardena et. al., 2001). Similarly Perraton (1988) argues that without a theoretical basis, research is unlikely to go beyond data gathering. Wever et. al., (2006) point out that the theoretical base is also of importance to ground the validity of the instruments. Neuendorf (2002) suggested that internal validity focuses on the match between the conceptual definition and the operationalisation, and in practice this refers to systematic coherence, which defines the relationship between the theory and the models used.

In the CSCL literature there is a variety of theoretical models/frameworks of collaborative learning generally used for the development of data analysis instruments. Considering the fundamental research question as,

- **To what extent is the current use of asynchronous online discussion environments based on the principles of collaborative learning?**

- it is essential to define the theoretical framework as it represents the specific conceptualisation of the concept 'collaborative learning'. Meier et. al., (2007) has pointed out that, any researcher with interest in studying collaborative processes has to answer two basic questions: 1) which aspects of the collaborative process are relevant for its success and should therefore be observed? And 2) how, by employing what kind of instrument producing what kind of data, should these

process aspects be assessed? The first question refers to the model of "good" collaboration the researcher employs; the second question is a methodological one. However, in practice, there could be two complementary approaches to answering the question: the researcher can either start with the data at hand (which would be the grounded approach) or with a theoretical model in mind. In case of the second approach, the theoretical assumptions would be the guiding point to analyse the empirical setting before labelling them as a collaborative learning environment. Moreover these initial assumptions could be helpful for comparing a wider range of collaborative situations against the background of their theoretical model.

The characterization of collaborative learning can be best understood from the perspective suggested by Roschelle and Teasley (1995) as the learning process occurring in a social environment through the mutual construction of knowledge.

Of course in the case of collaborative learning the individuals constitute the groups, but in this case learning in groups is not being treated as a matter of an individual learning process, which might be influenced by the contextual variables of social interaction. In the collaborative practice environment, the participants do not go off to do things individually, but remain engaged with a shared task that is constructed and maintained by and for the group as such (Stahl et. al, 2006). Here the fundamental focus is on the phenomena like the negotiation and sharing of meanings along with the construction and maintenance of shared conceptions of tasks that can be achieved only through the interactivity in the group processes.

For many years, theories of collaborative learning tended to focus on how individuals function in a group discussion. Obviously in that case the collaborative interaction was not significantly different from social interaction, the fundamental unit of analysis was individual, and cognition was seen as a product of individual information processors. Like other socio-learning approaches, in this specific framework of collaborative learning, social interaction has been considered as a powerful context for accelerating the process of individual cognitive activity. However more recently, the group itself has become the unit of analysis and the focus has shifted to more emergent, socially constructed, properties of the interaction, especially in order to understand how the cognitive

systems of the individual participants merge to produce a shared understanding of the problem due to the effective collaborative interactions.

From the Piagetian perspective, the mechanism of learning in collaborative settings can be explained from a different dimension compared to its interpretation in a normal social learning environment. The social interaction brings students to learn from one another because in their discussions of the content, cognitive conflicts are aroused, inadequate reasoning is exposed and higher quality understanding could emerge. Through mutual feedback and debate peers motivate one another to abandon misconceptions for better solutions (Slavin, 1995; Mugny and Doise, 1978). According to this assumption, cognitive conflict can be best defined as a state of disequilibrium - a Piagetian term meaning lack of mental balance. It is essential to the occurrence of what Piaget termed 'true learning', that is the acquisition and modification of cognitive structures. A conflict can lead to dissatisfaction with existing concepts, which is a crucial phase of conceptual change (Posner et. al., 1982). Cognitive conflict is usually a tense state (Zaslavsky et. al., 2002). Berlyne (1960) claims it plays a major role in arousing – a strong incentive to relieve the conflict as soon as possible. Therefore participants on different levels of cognitive development, or participants on the same level of cognitive development with different perspectives, can engage in social interaction that leads to a cognitive conflict. According to this perspective of cognitive conflict, new knowledge could emerge in the process of conflict resolution. However new knowledge is not so much a product of co-construction of shared understanding but is rather understood as taking place in the individual mind. Therefore the process of conflict resolution depends on individual cognitive capabilities guided by several factors like biological maturation or previous experience, and does not necessarily take place within the learning environment.

Collaboration is primarily conceptualized as a process of shared meaning construction; the fundamental focus is on the co-construction of knowledge through the conflict resolution within the practice environment. Stahl proposed in his recent article on CSCL (Stahl, 2010), that the shift to the group unit of analysis coincided with a focus on the community as the agent of situated learning (Lave, 1988) or collaborative knowledge building (Scardamalia & Bereiter, 1991). Therefore, the whole collaborative interaction could be considered as continuing

the resolution process, in which every time the participants can come back with the new conceptual structures and understandings for the further interaction and collaborative activities. Here the focus is no longer on what might be taking place in the heads of individual learners or how the individual learners resolve the issues of cognitive conflict by themselves, but the focus is on what is taking place between and among them in their interaction, or how the individual participants resolve the conflict through the process of extensive negotiation with others.

Most importantly for the development of a new conceptual structure through the resolution of cognitive disequilibrium, the participants need prolonged collaborative interaction, whereby the meanings of terms are clarified, alternative related statements are compared, linguistic expressions are refined, warrants are scrutinised and so on (Stahl, 2006). Therefore in collaborative settings, the interpretation of Piaget's (1977) theory stresses more the idea of co-construction of knowledge and mutual understanding. Due to the extended collaborative discourse, the participants gradually develop the capability to take account of other participant's perspectives, which is necessary for the co-construction of knowledge.

Similarly the interpretation of the Vygotskian perspective in a collaborative setting may have a different focus compared to its interpretation in the case of social learning. The most traditional interpretation of Vygotskian theory assumes that during engagement in group activities/interactions, the individual can have the opportunity to acquire some new skills that they could not do before the engagement. Due to the active involvement in the social process of learning, the individuals might gain knowledge and practice some new competencies as a result of internalisation. According to this perception, inter–subjective or inter psychological or group learning generally precedes individual or intra-psychological learning, which results from the internalisation of what took place socially (Stahl, 2005). Koshman (1996) proposed that, Vygotsky - one of the principal theoretical sources for CSCL – suggested the 'zone of proximal development' as 'a mechanism for learning on the inter-psychological plane' (p.12).

As Dillenbourg (1999) pointed out, in collaborative learning internalisation is more of a process than an effect. He has argued that "the main cognitive change

was less the transition from the intra - to the interpsychological plane, but, within the interpsychological phase..." Therefore in a collaborative setting, the Vygotskian (1978) perspective defines learning more as a matter of participation in the social process of knowledge construction than as an individual endeavour. Knowledge emerges through the network of interactions and is distributed and mediated among those (humans and tools) interacting (Cole and Wertsch, 1996).

Therefore the overall process of 'shared meaning construction' in the collaborative environment cannot be assumed to be an expression of mental representations of the individual participants, it is better to consider it as an interactional achievement. Within the specific setting of the collaborative plane, the emergent conceptions are analysed as a group product supporting the concept of the shared cognition approach.

Practically, it is impossible to categorise the metaphor of collaborative learning either as a purely acquisitional or purely participational point of view (Sfard, 1998). If the theories of collaborative learning can be assumed as the combination of social learning with constructionism (based on the theoretical framework of collaborative learning, proposed by Laurillard, 2009), then the latter part should demand the existence of a shared artefact in the learning environment, at least in the context of formal education as a form of evidence of the collaborative interaction. Therefore, the learning metaphor embraces the idea of 'acquisitional' principle.

Similarly, from the 'participationist' perspective the overall mechanism of knowledge development in collaborative interaction supports the idea of situatedness, contextuality, cultural embeddedness, and social mediation of the participationist metaphor. Different phases of knowledge construction like articulation, accommodation, co-construction or production of a shared artefact can be considered as the extended process of 'taking part' and 'being part' of the collaborative community, where learning should be viewed as a process of becoming a part of a greater whole. Fundamentally from this perspective from being a lone entrepreneur, the learner turns into an integral part of a team.

Probably because of this ambiguity in terms of the metaphor of collaborative learning, Lipponen, Hakkarainen & Paavola, (2004) add a third metaphor based

on the proposition by Bereiter (2002) and Engeström (1987): they suggested the 'knowledge creation metaphor', in which new knowledge objects or social practices are created in the world through collaboration.

The analysis of learning both at individual as well as at the group level makes CSCL methodologically unique (Stahl et. al., 2006). Therefore the theoretical framework for analysing the collaborative interactions should be primarily based on the three different theoretical positions: socio-constructivist theory (the Piagetian theory), socio-cultural theory (based on Vygotskian principles) and the shared cognition approach (which is based on the 'situated cognition' theory suggested by Suchman, 1987; Lave, 1988). And finally it has been also hypothesised that the existence of the group's collaborative knowledge should be manifested by the tangible outcome of a group artefact. Therefore the theoretical framework should encompass the idea of constructionism (Papert, 1991) as well.

This proposed theoretical model of collaborative learning enables me to choose the framework for the analysis of empirical setting.

Chapter four: Methodology

4.1 Introduction

All research or evaluation begins somewhere. All research is underpinned by some basic assumptions and there are different models or blueprints for research design. All research has a set of questions in mind or broad areas it is hoped to focus upon. Questions concerning the delineation of a topic or problem for investigation, location of certain sources of data, the choices of data collection procedures and how to analyse them are all initial preparatory questions, related to the design of research.

According to Robson (1993), the research design is concerned with turning research questions into projects. This is a crucial part of any enquiry, but it is often slid over quickly without any real consideration of the issues and possibilities. The general principle is that the research strategy or strategies and the methods or techniques employed, must be appropriate for the questions we want to answer.

This methodology Chapter is fundamentally the depiction of the justification for the research methodology as well as the research methods which I have used in this research project.

4.2 The general framework of research methodology

As proposed earlier in the 'Literature Review Chapter', the discussion forum is a significant component of online courses. Instructors and students rely on these asynchronous forums to engage one another in ways that potentially promote critical thinking, meaningful problem solving, and knowledge construction (Marra et. al., 2004). As an obvious result, in the last couple of years, online asynchronous discussion groups have become a primary focus of educational research (Pena-Shaff & Nicholls, 2004). However as pointed out by Wever et. al., (2006) in their article, at a first stage, research based on the discussion transcripts was restricted to gathering quantitative data about levels of participation (Henri, 1992). Strijbos et. al., (2006) has also highlighted that, initially analyses in CSCL and computer-mediated communication research focused on questionnaires or

surface level characteristics of the communication (Harasim, Hiltz, Teles, & Turoff, 1995). For example, participation degree was determined by the number of messages sent (Harasim, 1993), and it was assumed that the mean number of words in a message was positively related to the quality of that message's content (Benbunan-Fich & Hiltz, 1999). Surface level measurements are still used and several methods have been added such as 'thread-length' (Hewitt, 2003) and 'social network analysis' (SNA; Lipponen, Rahikainen, Lallimo & Hakkarainen, 2003).

However, according to Meyer (2004), these quantitative indices about numbers of student contributions hardly helped to judge the quality of the interaction. Or in other words, all the analyses cannot reveal the quality of the messages, i.e., whether the message content is relevant to the discussion and more importantly contains elaborative ideas or the types of cognitive skills that students use in their discussion, and whether learning is really improved by discussion, etc (Hua Guan et. al., 2006). Furthermore, the quality of group performance (product or grade) provides no insight into the actual collaborative process and contextual factors that affect collaboration. (Strijbos et. al., 2006).

As a result, at a later stage, content analysis was adopted as a technique to unlock the information captured in transcripts of asynchronous discussion groups (Wever et. al, 2006). Smith (2000) argues that content analysis is "a technique to extract desired information from a body of material . . . by systematically and objectively identifying specified characteristics of the material" (314).

In the context of computer mediated communication, content analysis is "a research methodology that uses a set of procedures to make valid inferences from text" (Anderson et. al., 2001, 10). In terms of Buraphadeja and Dawson (2008), CMC has opened up opportunities for learners to interact with instructor, course content, and other learners. Transcripts from CMC then could potentially be used as materials in finding evidence of critical thinking and knowledge construction using content analysis.

Generally, the aim of content analysis is to reveal information that is not situated at the surface of the transcripts. To be able to provide convincing evidence about the learning and the knowledge construction that is taking place, in-depth understanding of the online discussions is needed (Wever et. al., 2006).

In practice, the content analysis is the practical application of conversational analysis techniques for online environments (as cited in the article by Marra et. al., 2004). They also highlighted that, although discourses can be analysed at various levels, many studies are no longer focused on the strict linguistic sense of discourse (e.g., word order, phrase order) but rather examine their integration with other levels and dimensions of discourse such as how the information contained in previous sentences affects the discourse (Cumming & Ono, 1997). Conversation analysis, which is a subset of the overall field of discourse analysis, seeks to determine how online conversations (e.g. asynchronous, technology-mediated; Hutchby, 2001) contribute to the development of meaningful learning for participants. As Mazur (2004) noted, there is a "paucity" of conversation analysis methods for online discussion content.

Here, the fundamental research question **(To what extent is the current use of asynchronous online discussion environments based on the principles of collaborative learning?)** indicates that the objective of the research is to identify the extent to which an effective collaborative approach is being used, where the critical analysis of the overall learning process is much more important as opposed to simply identifying certain characteristics of socio-learning process. Here, CSCL interactions should be analyzed as a means of gaining insight into the processes of collaborative learning and trying to clarify what constitutes productive collaborative activity. Therefore, in this research the content analysis technique would be used to analyse the transcripts of the conference messages in order to judge both the group collaborative process and the contribution of the individual to that process (as proposed by Macdonald, 2003).

For the critical analysis of the process, it is important to recognise the presence of the different steps (i.e. social interaction, negotiation of meaning, co-construction of shared understanding or the production of a shared artefact), which might be done by coding the messages against these categories. As a consequence the general impression of the learning environment can be expressed in terms of the existence of certain interactional phases, and the relative occurrence of these can be represented by numbers, e.g. 8 messages in the phase of social interactions, 10 messages in the phase of negotiation of meaning, 12 messages in the category of co-constructing shared perspectives and so on. However this type of statistical

representation of behaviour cannot be directly related to the ontological position of the quantitative paradigm and does not label this research as quantitative.

The ontological position of the quantitative paradigm suggests that there is only one truth, an objective reality that exists independent of human perception. Furthermore, the selection of a method ought to depend on the purposes and circumstances of the research, rather than being derived from methodological and philosophical commitments (Hammersley, 1992). Therefore, although the statistical measurement has been used in this research specifically for the identification of certain behaviours in the learning situations, considering the objective of the research, the general ontological position of the quantitative paradigm is not applicable in this study.

Furthermore, it is important to highlight that a common pitfall about the qualitative paradigm is the misconception that qualitative research does not use quantitative data (Niaz, 2009). However as it has been presented in Niaz's article, Guba and Lincoln (1989), in their published work have been emphatic with respect to the use of quantitative data in qualitative research. They proposed that,

> . . . qualitative methods are preferred, and not because these methods are the basis for defining the constructivist paradigm (as they are often taken to be; . . .). Moreover, there is nothing in this formulation that militates against the use of quantitative methods; the constructivist is obviously free to use such methods without prejudice when it is appropriate to do so (for example, using a questionnaire, poll, survey, or other assessment device to gather information from a broad spectrum of individuals ... (Guba and Lincoln 1989, p. 176).

In this context the numbers of messages in different categories of collaborative interactions have been used in a descriptive way not to prove hypothesis in an analytical way. The numbers are only the prerequisite to identify certain characteristics of the interactional process; however the main objective is to understand the sequential structure and situated methods of interaction. Or in other words it needs the descriptive interpretation of the empirical situation and the emerging data (it is important to mention over here this implies the characteristic of qualitative research, according to Fraenkel & Wallen, 1990; Locke et. al., 1987; Marshall and Rossman, 1989; Merriam, 1988). The sequential

structure highlights the pattern of emerging cognitive mechanisms due to the intertwined nature of interaction. Similarly the situated characteristic highlights the specific contribution of the practice environment to foster productive interaction.

In practice the in-depth understanding of the learning dynamics requires a retrospective approach (Strijbos et. al., 2006). And the interpretation of the situation largely depends on researcher's individual perspective to analyse the situation. Or in other words this sort of interpretation is very much subjective, there could be multiple interpretations based on one's construction of reality. In this context reality is socially constructed (Berger and Luckmann, 1966) and so is constantly changing. There is no access to reality independent of our minds, no external referent by which to compare claims of truth (Smith, 1983).

Therefore in order to label the learning situation as an effective collaborative environment, the quality of the discussion to produce the shared artefacts, mainly the process of collaborative knowledge building should be critically analysed according to the pure subjective interpretation of the researcher supported by the theoretically prescribed model of collaborative interactions. Moreover the effectiveness of individual collaborative discussions should be judged through the outlook of different tutors, based on their perception as well as the experience of their professional field. This again supports the initial assumptions of qualitative research, according to which the focus of qualitative research is on participant's perceptions and experiences and the way they make sense of their lives (Fraenkel & Wallen, 1990; Locke et. al .1987; Merriam, 1988). Moreover, qualitative research focuses on the process that is occurring as well as the product or outcomes. Researchers are particularly interested in understanding how things occur (Franken & Wallen 1990; Merriam, 1988).

In this study, the objective is to capture the complex mechanism of the collaborative knowledge building process. It is important to understand how the tacit understanding of the individuals resulted in the development of collective knowledge through the process of mutual negotiation which is the primary consideration of any collaborative learning environment. And finally, the overall understanding of collaborative learning should be developed by contrasting, comparing, replicating, cataloguing and classifying the object of study (Miles and

Hubermon, 1994). Therefore considering the purposes and circumstances of the research, this is likely to be based on qualitative paradigm.

However the qualitative research is the combination of various methodological approaches, and as a result before embarking on a specific approach, it is better to consider the brief outline of the study.

4.3 The selection of an appropriate research method for this study

From the critical evaluation of the fundamental research question as well as from the objective of the research, it is evident that this sort of research can be easily categorised as the evaluation of a process within its specific boundary. Therefore, the selection of an appropriate research method for this study should be aligned with its objective or the purpose of investigation.

Now the analysis of the threaded discussion for the identification of the purported outcome of the collaborative discussion can be based on two possible methodological approaches, one grounded theory and second the Case Study approach. However, the selection of methodological approach is based on the two major considerations, one the specific objective of the research and seconds the advantage of using a particular methodological approach, which could be helpful to design the research most effectively to answer the research question.

Therefore, at this stage before making a selection between grounded theory and Case Study approach, it is better to consider the fundamental characteristics of these two research designs.

4.31 Grounded theory

The grounded theory approach purported to be inductive rather than deductive. The intent is to develop an account of a phenomenon that identified the major constructs or categories in grounded theory terms, their relationships, and the content and process, thus providing a theory of the phenomenon that is much more than a descriptive account (Morse and Richard, 2002; Becker, 1993). The purpose of grounded theory is to organise 'many ideas from analysis of the data' (Glaser & Strauss, 1967, p.23). Later Strauss and Corbin (1990, p.24) extended this by saying that the purpose of grounded theory was to build a theory 'that was

faithful to and illuminated the area under study'. Such theories developed are not necessarily intended to stand alone, but could be related to existing theories within a field, thus amplifying and extending the current understandings of the phenomenon in question. Thus the researcher, rather than commencing with a theory which he or she attempted to verify, commenced with an area of study and allowed relevant theoretical constructs to emerge from that process of study, thus allowing an intrinsic relationship to develop between the idea and the theory. The end result of this type of qualitative research is a theory that emerged from, or is 'grounded' in the data, hence grounded theory. As Strauss and Corbin (1994, p.274) noted, 'the major difference between this methodology and other approaches to qualitative research was its emphasis upon theory development'. Moreover they proposed that, in grounded theory, 'data collection, analysis and theory stand in a reciprocal relationship with one another. One does not begin with a theory, and then prove it. Rather, one begins with an area of study and what is relevant to that area of study is allowed to emerge' (Strauss and Corbin, 1990, p.23).

At this point it is essential to make a relation between what is intended to achieve through this research, and how we can successfully design the research to achieve the goal by using the grounded theory approach. So far the previous discussions have made it clear that the objective of this research is not focused to develop any new theoretical framework for collaborative learning. The intention is to consider the existing theoretical propositions as a framework which would be used for the evaluation of the current practice of collaborative learning especially in the context of asynchronous online discussion. Most importantly here the interaction analysis model should not be evolved through the gradual analysis of the data, rather the data or the threaded discussions should be categorised under the defined categories of the pre-existing analysis model. And this objective or the purpose of the study is significantly different from the epistemological perspective of grounded theory. Therefore, for the effective research design of this project, grounded theory could be substituted by another methodological approach.

4.32 The qualitative Case Study

Among the various approaches of qualitative research, the qualitative Case Study is a prominent approach to research that facilitates exploration of a phenomenon within its context using a variety of data sources (Baxter and Jack, 2008). The in-depth analysis of the empirical situation by using the multiple data sources ensures that the issue has been examined from various angles, which could be beneficial to understand the phenomenon from multiple dimensions. Here it is important to consider that, the use of a Case Study approach is determined by four factors:

- The nature of the research questions.
- The amount of control the researcher has over the conditions under investigation
- The desired end product and
- The identification of a bounded system as the focus of investigation (Merriam, 1988, p.8).

While defining the nature of the research question, Yin (1994) suggested that for 'how' and 'why' questions, the Case Study had a distinct advantage over other research designs. As this research project is very much concerned with the investigation of the current practice of collaborative learning, or in other words as it involves the question like how far the theoretical propositions of collaborative learning has been successfully translated into practice, it might be concluded that the initial factor of a Case Study research is clearly reflected in its purpose.

As far as the second factor is concerned, it can be stated that the objective of the research is the evaluation of the collaborative learning mechanism, not to control the conditions of the learning environments. Here the collaborative learning process should be monitored in different practice environments, without attempting to influence how they operate, rather to observe and analyse how they conduct.

The desired end product, which has been specified as the third factor can be considered the final outcome of the collaborative learning, which would be reflected through the detailed analysis of the individual collaborative learning environment or in other words by analysing the data from different case. And finally, the learning situations should be limited by a specified time; in this project

there is no intention to evaluate the learning effects of collaboration over an unspecified period of time. Moreover another major interest is to monitor the learning effect in small groups not in community. Therefore, every case is predominantly a bounded system which is the prime focus of investigation.

From this preliminary analysis, it is obvious that there is a clear alignment between the objective of this research and the factors which generally guide the researcher to choose the Case Study approach as their prime research method. However the following section will try to illuminate in depth, the significance of the Case Study approach as an appropriate method for this research.

4.4 Case Study method

Case Study research can be classified as a qualitative method, and, the purpose of which is to try to understand, or interpret, phenomena in terms of the subjective meanings people bring to them (Denzin, 1994). Merriam defined Case Study as 'an examination of a specific phenomenon such as a program, an event, a person, a process, an institution, or a social group' (1988, 9). According to Yin (1994), Case Studies are rich, empirical descriptions of particular instances of a phenomenon that are typically based on a variety of data sources. From all these definitions it is quite obvious that, in an evaluation context, like the circumstance of this research project to document and analyse the process as well as the quality of the apparent collaborative approaches taking place in the context of asynchronous collaborative discussion, Case Studies could be related with process evaluations (Yin, 2003).

From the perspective of both Stake (1995) and Yin (2003), the overall approach of Case Study can be based on a constructivist paradigm. From the ontological point of view, constructivists base their claim on a subjective truth, where the interpretation of the particular phenomena is dependent on one's perspective. According to Searle (1995), the conceptual framework of constructivism is built upon the premise of a social construction of reality. This constructivist paradigm of the Case Study approach develops a close collaboration between the researcher and the participant, while enabling participants to tell their stories (Crabtree & Miller, 1999). In practice, these stories are the reflection of participants' views of

reality and this could be really advantageous for the researchers to better understand the participants' actions (Lather, 1992; Robottom & Hart, 1993). In the context of online discussion there could be several different approaches to conduct the discussion, which is mainly based on the subjective definition of 'collaborative learning' made by the tutors. Therefore the constructivist paradigm of Case Study can provide a great opportunity to evaluate the whole mechanism of the process in conjunction with a consideration of the individual tutor's perspective about the theoretical belief. It carries out an investigation of the process by placing people (the tutors) in their real life context (in the online discussion forum). This strategy is essential to establish a relation between what they believe and how do they practically implement that perception in their day-to-day activities.

4.41 Types of Case Study

According to literature generally the approach of conducting a Case Study can be categorised into two distinctive types. One a holistic Case Study with embedded units and the other multiple Case Studies. On the one hand, the holistic Case Study with embedded units can only allows the researchers to understand one unique/extreme/critical case (Baxter and Jack, 2008). On the other, in case of multiple Case Studies, the researchers are allowed to examine several cases to understand the similarities and differences between cases. Yin (1994) proposed that, like series of related laboratory experiments, multiple cases are discrete experiments that serve as replications, contrasts, and extensions to the emerging theory. However, while laboratory experiments can isolate the phenomena from their context, Case Studies always include an intensive analysis of an evolutionary description of a phenomenon within its context.

Moreover, Yin (2003) proposed that, multiple Case Studies can be used in two different circumstances, "(a) predicts similar results (a literal replication) or (b) predicts contrasting results but for predictable reasons (a theoretical replication)" (p. 47). In this specific research project, the major emphasis has been on discovering characteristics and relationships not demonstrating or confirming hypotheses. Therefore it is important to select a variety of cases (rather than analysing one single case from multiple dimensions) enabling me to see the

extent to which there are commonalities, where there are differences in perception, and what the possible causes might be. Considering Yin's suggestion, it is much more logical to say, according to the design as well as for the objective of this research study, the multiple Case Study approach (involving four different cases) is significant mainly for predicting contrasting results but for predictable reasons (for example the perception of the tutors about collaborative learning, the way of implementing the theory into practice or the nature of task design), i.e. for theoretical replication.

4.42   The scope of the Case Study

Yin (1994) proposed that, "the more a study contains specific propositions, the more it will stay within reasonable limits' (Yin, 1994:137). It suggests that, the fundamental objective of doing Case Study, i.e. the general expectation of doing the in-depth analysis of the situation, could be hindered if there are too many objectives for one study. As a solution, several advocates of Case Study research including Yin (2003) and Stake (1995) have suggested that placing boundaries on a case can prevent this explosion from occurring. The possible approaches of placing these boundaries might include (a) by time and place (Creswell, 2003); (b) time and activity (Stake, 1995) and (c) by definition and context (Miles and Huberman, 1994). Bromley (1986, p.21) also confirmed that a Case Study 'must be limited in scope..... there must be conceptual boundaries and empirical limits to it'. Merriam (1998, p.27) agreed and stated that 'if the phenomenon ....is not intrinsically bounded, it is not a case'.

In this specific Case Study research, the boundary has been chosen in terms of time and activity. For the exploration of the research question, there would be four cases under investigation. However, it is quite true that, under each case there could be several activities, and each activity can act as a coherent case of a collaborative learning effect, potentially. However considering the time as well as the scope of the research, for each individual online course, only two sets of activities, one just after the initial introductory activity, and a second (just before the ending of the course) have been chosen for detailed analysis. On average each case would be composed of hundred messages.

The justification for this kind of selection process can be explained by considering the theoretical propositions suggested in the literature, for example taking into account the proposal by Amhag and Jakobsson (2009) and by Reimann et. al., (2006).

According to the study by Amhag and Jakobsson (2009), the competence to use collaboration as a learning tool does not seem to be a quality that the participants automatically have when they participate in online education. Rather, this ability should be understood as a collective competence that a group of participants could develop while they are collectively engaged in a course assignment in online settings. Therefore the analysis of the threaded discussion, especially at the initial stage as well as near the completion stage, could reflect the participants' gradual improvement in acquiring the skill of collaboration within the practice environment, which may then result in the subsequent changes of their pattern of interactions to produce the high quality shared artefact.

Similarly from the perspective of management-based approaches to scaffolding collaboration (Reimann et. al., 2006), constant evaluation of the collaborative discourse can provide the opportunity to the tutors to modify the learning situation (possibly by changing the existing model of task design or by changing the nature of involvement with the practice situation) in terms of the needs of that particular environment. Therefore the selection of these two different sets of activities, at different points in the progress of the discourse, will offer an insight into the role of the tutors in obtaining their desired outcome of collaborative interactions.

4.43 A theoretical framework for the study

Finally for a successful Case Study, there is an essential need to develop preliminary conceptual framework at the outset. Practically, several purposes could be served by using this sort of framework. For example according to Miles and Huberman (1994), it could be helpful for (a) identifying who will and will not be included in the study; (b) describing what relationships may be present based on logic, theory and/or experience; and (c) providing the researcher with the opportunity to gather general constructs into intellectual "bins" (Miles & Huberman, p. 18).

As discussed in Chapter three the whole design of this empirical research is based on a theoretical framework which served as an anchor to identify the criteria for selecting and screening potential candidates for the cases to be studied, and to suggest the relevant conditions of interest (like the role of the tutor for the effective collaborative discussion which in practice also includes the role of task design in a implicit way), and therefore the data to be collected as part of the Case Study. Similarly, the theoretical framework of collaborative learning emphasises the completion of collaborative interaction through the production of a tangible shared artefact. Therefore, the research interest is very much confined in the development of collaborative knowledge within small groups as opposed to communities, because in the former situation (i.e. the small group interaction), it is much easier to observe the resolution of cognitive conflict (the Piagetian theory), or the process of internalisation (Vygotskian principle), or the co-construction of knowledge through the shared cognition approach (shared cognition theory). Moreover, in terms of the framework the process should be completed within a required time (as it is important to observe the whole process of collaboration in a practice situation), as the collaborative learning process associated with lifelong learning is difficult to observe. Depending on these two characteristics the selection of the cases are restricted to the collaborative interactions within a small group for a specified time.

4.44 The brief outline of the cases chosen for Case Study research

According to the literature, perhaps the most unique aspect of Case Study in the social sciences and human services is the selection of cases to study (Stake, 1994). Understanding the critical phenomena may depend on choosing the case well (Patton, 1990; Yin, 1989). The phenomenon of interest observable in the case represents the phenomenon generally (Miles and Huberman, 1984).

Here, among the four different cases, the fundamental objective is similar as the course outline for each case explicitly indicates that the participants will be expected to read and study the learning materials supplied with the course and to develop their collaborative and group working skills online at a distance. In all

these four cases the fundamental objective was the conceptual development as opposed to the skill acquisition through the procedural activities. Therefore, the expectation was the participants should take part in the collaborative knowledge development process through the inter personal engagement in the practice situation.

Moreover, it is important to mention that these four cases were selected as permission had been granted for access to the whole course, and consent had been given to keep the copy of the entire discourse (without this permanent record it would have been impossible to analyse the data in my own time). Initially I sent out the mails to the tutors who run this type of course. In most of the cases the tutors were identified through the personal network of other like minded people. However getting access to the personal discourse (as often transcripts contain 'private information' that has been posted to the conferencing group), is a subject of ethical consideration. Therefore, it is not only important to get the permission of the tutor; it is essential to get the approval from every individual participant. And in this process, sometimes I have not been allowed to get into the discourse as some of the members of the group were not interested to disclose their contributions. Consequently, in the end I have been authorised to use all those data where not only the tutor but also the participants were ready to be a part of this research. And to accomplish this process, I have requested each participant to sign a conventional informed consent release form in which the standard information was provided to participants describing the fundamental issues of this research, detailing: the nature of the investigation, potential harm and benefits, how the information obtained is to be used, and how the participants can contact the researchers to discuss any concerns they may have. The details of the consent release form have been provided in the appendix section of this thesis.

The following sections are the brief introductory outline of the individual case.

A. Case one: Security Management

This is the module from a course for M.Sc in Information Security. This course addresses the major themes of Security Management, including people, processes and technology with particular emphasis on the role of policy in helping to shape an organisation's security management strategy. The module is offered as a

distance learning course, using Moodle – the virtual learning environment. The detailed outline of this case has been provided in Chapter seven.

B. Case two: Course in Development Education

This is the module from a course for MA in Development Education. The objective of the course is to develop the overview on the topics like 'Principles and Practices of Development Education' and 'Development Education in the Era of Globalisation'. Here as well the module is offered as a distance learning course using the technical infrastructure of Blackboard (Bb). Full description has been provided in Chapter eight.

C. Case three: Learning, Education and Development, concepts and issues.

This course is specifically the core MA module, "Learning, Education and Development: Concepts and Issues".

The aims of the course are to:

- Introduce a range of concepts, issues and theories from the social and political sciences that assist the understanding and analysis of the relationship between education, learning and international development in low and middle income countries ;
- Explore critically the changing links between these relationships at individual, local, national, regional, international and global levels ;
- Introduce and discuss issues of educational policy and practice in low and middle income countries.

The module is offered as a distance learning course tutored using Blackboard (Bb). The details are the part of Chapter nine.

D. Case four: Introduction to Cryptography and Security Management.

This is the module from a course for M.Sc in Information Security. The particular focus is on cryptography and security mechanisms. Pitched at just the right level for non-maths graduates, the objective of the course is to explain the roles of all the major cryptographic primitives, including symmetric key cryptography (block

and stream ciphers), hashes, message authentication codes, asymmetric (public) key cryptography and digital signatures. Once again the module is offered as a distance learning course, using Moodle – the virtual learning environment. The general overview of the course is available in Chapter ten.

4.45 Critics of the Case Study method

A major concern is that generalisation is not possible by using the Case Study approach. However in this context I have used two perspectives suggested by Denscombe (1988) and Bassey (1981) and very much supported by Bell (2005).

Denscombe (1988:36-7) makes the point that ' the extent to which findings from the Case Study can be generalised to other examples in the class depends on how far the Case Study example is similar to others of its type'. He illustrates this point by considering the example of a Case Study of a small primary school. He writes that:

> This means that the researcher must obtain data on the significant features (catchment area, the ethnic origins of the pupils and the amount of staff turnover) for primary schools in general, and then demonstrate where the Case Study example fits in relation to the overall picture (1988:37).

As discussed earlier, the definition of 'collaborative learning' is subjective, and completely depends on how the practitioners have perceived the overall concept, and what sort of theoretical model they believe in. Depending on these initial propositions, the design of collaborative learning environment could be significantly different from one another, and even the overall structure might be dissimilar depends on various conditions like, subject matter, participants' age, gender, academic profile, culture and finally the difference in technological tools responsible for mediating the collaborative interaction. Therefore from this empirical study it is quite difficult to comment on the general approach of asynchronous discussion taking place in various situations, however the results (obtained from four different online cases) could reflect the similar characteristics of online discussions that have more or less the similar specification.

In his 1981 paper on the relative merits of the search for generalisation and the study of single events (although the similar justification is quite applicable even in

case of multiple events), Bassey preferred to use the term 'relatability' rather than 'generalisability'. In his opinion,

> .....an important criterion for judging the merit of a Case Study is the extent to which the details are sufficient and appropriate for a teacher working in a similar situation to relate his decision making to that described in the Case Study. The relatability of a Case Study is more important than its generalisability (Bassey, 1981:85).

He considers that if Case Studies;

> ... are carried out systematically and critically, if they are aimed at the improvement of education, if they are relatable, and if by publication of the findings they extend the boundaries of existing knowledge, then they are valid forms of educational research (p.86).

Consideration of the recommendations suggested by Denscombe and Bassey clearly reflects that the contribution of Case Study is only understandable if we compare the results for similar context where the apparent conditions are generally similar in character. When there is a strong commonality between the empirical situation and the practice environment outside the research, it is quite easy to transfer the knowledge/empirical results from one context to another (i.e. the fundamental assumption of relatability). Therefore implicitly the generalisation is applicable in Case Study research if the contexts are similar in character.

Here, according to the main research question, the primary objective of the research could be considered as making explicit the trends of asynchronous collaborative discussion happening under certain contextual specifications. It could be helpful to demonstrate certain cause-effect relationships of collaborative learning again under a specific theoretical framework. The detailed analysis of the threaded discussion and the consideration of the associated factors influencing the quality of interactions could be helpful for the practioners to recognise the issue as well as it can motivate them to act on it. Therefore from the perspective of relatability, the findings of this empirical research are not only applicable in similar contexts, but also they are aimed at the improvement of education and can extend the boundaries of existing knowledge.

4.5 The methods of data collection and analysis

Before selecting the methods of data collection, it is important to think about which of the possible approaches of data analysis would address the research question in the most effective way.

Considering the research question, i.e. to assess the quality of the asynchronous threaded discussions against the theoretically prescribed collaborative learning, there is a need to confirm one specific framework, which I have selected in Chapter three in the name of 'collaborative learning framework'. This collaborative learning framework requires the categorisation of the messages in the different phases of collaborative discussions for the detailed exploration/ analysis of the quality of interaction. Consequently, the method of 'content analysis' has been adopted for this empirical research (a detailed description is provided in the following Chapter five). In practice, for the application of the 'content analysis' scheme, there is the need to 'observe' the online threaded discussion. However the observation can only scrutinise the dynamics of the collaborative learning environment. It cannot provide the detailed description in terms of the perception of the tutors about collaborative learning and its immediate effect on the designing as well as the facilitating aspect of collaborative discourse.

One of the other fundamental research interests is to capture the relationship in terms of what the tutors are doing and what the participants are experiencing as an obvious effect in the collaborative environments. Consequently, apart from analysing the data captured through the observation of online discussions, there is a need to encapsulate the tutors' views, in order to make a relationship between their perception and practice. This analytical approach has guided the methods of data collection.

Furthermore, the Case Study research strategy is always accomplished with the use of multiple data sources. The various strands of data enhance the credibility of the empirical results. In practice rather than handling the different categories of data individually, the convergence of data from multiple sources could be useful to get the overall picture of the case. In other words, each data source could be considered as one piece of the 'puzzle' with each piece contributing to the researcher's understanding of the whole phenomenon (Baxter & Jack, 2008).

Moreover from the overall perspective of qualitative research, there should be a concern about the 'internal validity'. According to Miles and Huberman (1994), internal validity has to do with questions such as "Do the findings of the study make sense? Are they credible to the people we study and to our readers? Do we have an authentic portrait of what we were looking at?" (p. 278).

In the context of qualitative Case Study research, the concept of 'internal validity' can be successfully addressed by using the approach of 'multi method triangulation'. Kopinak (1999) has defined the approach as entailing "gathering information pertaining to the same phenomenon through more than one method, primarily in order to determine if there is a convergence and hence, increased validity in research findings" (Kopinak, 1999: 171). Kopinak indicated that the use of more instruments would provide for more detailed and multi-layered information about the phenomenon under study. In this study, the approach of multi method triangulation has been used as a process of combining the different sets of data, obtained from different instruments. The data gathered from semi-structured interviews with the tutors and access to the online classes (for the analysis of the threaded online discussions) has been combined in order to develop a comprehensive view of the collaborative discussions taking place in the asynchronous online context.

4.51 Interview

The interview as a research technique is very much based on the socio cultural concept of learning. That is because its very form is derived from verbal interaction between the investigator and the respondent. Many insist that the best way to find out why people behave as they do is to quiz them about their conduct directly by talking to them. Beyond this universally recognised feature, a wide range of views on the essentials of interviews can be found.

According to Denzin (1970, p.195),

> An interview is any face-to-face conversational exchange where one person elicits information from another.

The research interview has been defined as 'a two person conversation initiated by the interviewer for the specific purpose of obtaining research-relevant

information, and focused by him on content specified by research objectives of systematic description, prediction, or explanation' (Cannell and Kahn, 1968).

Practically if we believe in the social constructivist theory then the interaction between the interviewer and the interviewee can be considered as a great source of mutual knowledge construction.

The interviews have been used extensively across all the disciplines of the social sciences and in educational research as a key technique of data collection. This has given rise to considerable diversity in the form and style of interviewing as well as the products of such an approach. The differences refer to such matters as the nature of the question asked, the degree of control over the interview exercised by the interviewer, the numbers of people involved and the overall position of the interview in the research design itself. The most common type of interviewing is individual, pair and group interviews and in terms of structure, it can be structured, semi-structured or unstructured.

It is quite understandable that the application of 'collaborative' approach is to some extent depends on the interpretation/conceptualisation of the term by the individual practioners. Therefore along with the analysis of the threaded discussion in the online course, it is important to capture their interpretation of certain aspects (like the definition of collaborative learning or the significance of task design for effective collaboration), which could be considered as the building blocks of one online class.

From this objective of the interview it is quite clear that an 'emotionalist' perspective of interview (Silverman, 2001) has been used in this study. The approach is illustrated in Charmaz (1995, cited in Silverman, 2001):

> We start with the experiencing person and try to share his/her subjective view. Our task is objective in the sense that we try to describe it with depth and detail. In doing so, we try to represent the person's view fairly and to portray it as consistent with his or her measuring (Charmaz, 1995, p.54).

In practice, emotionalist interviews are about 'symbolic interaction' (Silverman, 1993, p.94). Silverman proposed that, the emotionalists want to see the interview as 'an encounter... [that] represents the coming together of two or more persons for the purpose of focused interaction'. In this approach, the interviewees are

encouraged to share their experience with the interviewer in a comfortable situation.

After considering all these significant issues I have organised four sets of semi-structured interviews with four individual tutors (their online courses I have analysed in this piece of research).

4.52 The value of the semi-structured interview

In practice, the semi-structured interview is a much more flexible version of the structured interview.

In Powney and Watt's (1987), terminology, the semi-structured interview is still a respondent interview, although in terms of its tactics the researchers have greater freedom in the sequencing of questions, in their exact wording, and in the amount of time and attention given to different topics (Referred in Robson, 1993, p.237).

The semi-structured interview is the one that tends to be most favoured by educational researchers since it allows depth to be achieved by providing the opportunity on the part of the interviewer to probe and expand the interviewee's responses.

Most commentators agree that the logic of semi-structured interviewing is to generate data interactively, and Kvale has described qualitative research interviews as 'a construction site of knowledge' (Kvale, 1996, p.2). This implies that the interviewer and not just the interviewee are deemed to have an action reflexive and constitutive role in the process of knowledge construction. The data that I have accumulated during the course of these interviews derived from the interaction between the research participants and me, rather than simply the answers given by the respondents only.

Finally, at the end of all interviews I realised that the interview is a flexible and adaptable way of finding things out. The human use of language is fascinating both as a behaviour in its own right, and for the virtually unique window that opens on what lies behind our actions.

However interviewing is time consuming. Anything under half an hour is unlikely to be valuable; anything going much over an hour may be making unreasonable demands on busy interviewees, and could have the effect of reducing the number

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of persons willing to participate, which may in turn lead to biases in the sample that we achieve.

Another significant issue is that all interviews require careful preparation, which takes time. Notes need to be written up; tapes used, require whole transcription, subsequent analyses are again a time consuming matter.

4.53 The observation of online discussion

According to the research question, the detailed analysis of the online classroom dynamics was essential, even it was important to make a relation between individual tutor's perception about collaborative learning and the application of that perception in real virtual learning environment. Ideally this sort of approach supports the idea of participant observation, as Mac an Ghaill (1996) has argued, the participant observer collects data by participating in the daily life of those he or she is studying. "The approach is close to everyday interaction, involving conversations to discover participants' interpretations of situations they are involved in" (Becker, 1961, p.652). However in this case the situation is slightly different. In the computer mediated classroom, as it is configured in all the cases under investigation, instructors and students are mainly presented by text on a screen. It is impossible to see the facial expression and body language that help us gauge responses to what is being discussed. It is impossible to hear voices or tones of voice to convey emotion. Therefore the entire dynamics of the online classrooms can be understood by content analysis of the discussion forum, and in practice, there is hardly any difference if we get access to the live discussion or analyse the stored data of previous discussion forum. Practically, as far as the identification of the collaborative process is concerned, the content analysis of the written contributions to the discussions could be particularly helpful as it "makes the process of collaboration more transparent [for the researcher], because a transcript of these conference messages can be used to judge both the group collaborative process and the contribution of the individual to that process..." (Macdonald, 2003, p.378).

4.6 Conclusion

The aim of this Chapter was to illuminate the general framework of research design by providing the justification of choosing the particular research

methodology and the associated research approach. The introduction of the methods of data collection and analysis completes the picture of entire research design. In the literature, Yin (1994) proposed that every type of empirical research has an implicit, if not explicit research design. If it is assumed that a design always exists, it is important to make it explicit, to get it out in the open where its strengths, limitations and consequences can be clearly understood (Maxwell, 2005).

Considering the proposition of Maxwell, it can be stated that, this research design also explicitly defines the significance of using a coding scheme in this research. Similarly the selection of Case Study approach indicates the fundamental objective of the research in terms of the in depth evaluation of the learning mechanisms in the collaborative situation. Moreover it has also clearly highlighted the significance of 'relatability' over generalisability of the research findings. The concept of 'relatability' signifies the idea that probably the research findings cannot portrayed the mechanisms of all kinds of collaborative situations different in terms of their design and other attributes, however the test results should be definitely related with the pedagogy of those practice situations of collaborations which have the similar characteristics exactly like the Case Study situations.

Chapter five: Content analysis for collaborative learning

5.1 Introduction

In this Chapter, I can now turn to the discussion of the selection of a suitable content analysis scheme along with the methodological issues relating to the reliability and the validity of the research. With a brief overview of the different content analysis schemes described in the literature, an analytical approach is adopted to evaluate the appropriateness of the existing analysis scheme against the objective of the research. At the same time the later part of this Chapter will be reflecting the justification for proposing a new modified model for the analysis of the threaded discussion.

5.2 Content analysis schemes to analyse online asynchronous discussion groups.

Considering the summary of the theoretical proposition suggested earlier (i.e. the Chapter three, 'collaborative learning framework'), although collaborative learning has been grounded in the fundamental assumptions of social learning, still it is not all about measuring the individual trajectories of meaning making, it is primarily based on the essentially social practices of joint meaning making.

Once the theoretical framework has been finalised, it is important to consider the appropriate methods for analysing interactive processes taking place in the practice environment. There is a need for a well defined standard for judging the observed behaviours against it to yield a direct evaluation of the quality of the collaborative process.

Therefore, in this situation, there is a need to design models and instruments in order to recognise the process of collaborative learning in the context of online asynchronous discussion. However rather than going for designing a new model and instrument, it is advisable to apply existing instruments as it can foster the replicability and the validity of the instrument (Stacey and Gerbic, 2003). Moreover, supporting the accumulating validity of an existing procedure has another advantage, namely the possibility to use and contribute to a growing

catalogue of normative data (Rourke & Anderson, 2003). Therefore it is important to choose a model which would fit within the proposed theoretical framework.

5.21 Various content analysis schemes available in the field of CSCL research.

According to Wever et. al., (2006), in the field of CSCL, there is a variety of techniques often used to analyse transcripts of asynchronous computer mediated discussion groups in formal educational settings. The applied instruments reflect a wide variety of approaches and differ in their level of detail and the type of analysis categories used.

For example, Newman et. al., (1995) developed a content analysis instrument based on Garrison's (1991) five stages of critical thinking and Henri's (1992) cognitive skills. The theoretical concepts that support their instrument are group learning, deep learning and critical thinking as they argue that there is a clear link between critical thinking, social interaction and deep learning.

The theoretical framework of Zhu's (1996) study is based on a combination of Vygotsky's theory and theories of cognitive and constructive learning.

Veerman and Veldhuis-Diermanse (2001) situate the use of CSCL within a constructivist framework. They proposed that 'collaborative learning can be viewed as one of the pedagogical methods that can stimulate students to negotiate such information and to discuss complex problems from different perspectives'.

Cognitive presence is another element in the community of inquiry model proposed by Garrison, Anderson and Archer (2001).

Lockhorst et al., (2003) base their instrument on a constructivist framework.

Pena-Shaff and Nicholls (2004) developed an instrument to evaluate the knowledge construction processes in online discussion.

Weinberger and Fischer (2005) propose a multi-dimensional approach to analyse argumentative knowledge construction.

The theoretical framework for most of these instruments, viewed collaborative learning as a pedagogical method. In that prescriptive sense, researchers have

expected that while collaborating with two or more people, the participants should learn effectively, due to the pedagogical benefit of collaborative learning. However this assumption might create a conceptual problem. For example, there is no guarantee that higher order mental functions should always occur in collaborative interactions. Similarly, we cannot conclude that these types of cognitive activities (explanation, disagreement, mutual regulation, etc) and their immediate effects (knowledge elicitation, internalisation, reduced cognitive load, etc) can only be achieved during collaborative interaction (Dillenbourg, 1999).

5.22 The pilot stage: Gunawardena's model

Apart from these content analysis schemes, in the literature, the instrument of Gunawardena et. al., (1997) has been presented as a tool to examine the social construction of knowledge in computer conferencing (Wever et. al., 2006). In this interaction analysis model, it has been hypothesised that knowledge can be created at the social - the level of the group - and the individual can also create his or her own understanding by interacting with the group's shared construction. The theoretical framework for the instrument results from socio constructivist principles: the processes of negotiating meaning and coming to an understanding by discussing and contributing knowledge, thus resulting in the mutual construction of knowledge (Kanuka & Anderson, 1998).

This interactional analysis model is one of the examples of different techniques available for the analysis of the transcripts of asynchronous discussions. I used this model in the pilot stage of the research, and as a result I found it gradually led to a change of direction.

The model was used to analyse three different online discussion forums. Of the three different cases of online classes, one (course A) had been conducted in the context of a wholly distance learning course in a large university; the other two courses (course B and C) had been run in a smaller-scale university environment.

Course A was a kind of staff development programme. The objective was to give the students an introduction to supporting their students using online conferencing. The discussion group was composed of eight students. I observed only one week's course.

Course B was again a staff development programme, but in this case the objective was to give the students a basic theoretical framework showing how new technologies can be seen as media in the teaching process. Ten students were in the discussion forum and analysis was done for one week's discussion.

Course C was an online course named 'Qualitative data analysis: a framework course'. The aim was to get the students to work through the issues involved in 'dealing with' qualitative data. Coding was done for one week's discussion where seven participants were involved in the mutual interactions.

Following the recommendation by Gunawardena et al., my coding system used a message as a unit of analysis and coded each message according to the phases and operations defined in the model (Gunawardena 1997):

- Phase I : Sharing/comparing of information
- Phase II: Discovery and exploration of dissonance or inconsistency among ideas, concepts, or statements
- Phase III: Negotiation of meaning/co-construction of knowledge
- Phase IV: Testing and modification of proposed synthesis or co-construction
- Phase V: Agreement statement(s)/applications of newly constructed meaning.

From these three Case Studies of contrasting courses, it was clear that the analysis of the threaded discussions using Gunawardena's model could provide evidence that new knowledge is created within the discussion environment. However in this model, in the name of distributed cognition, the aspect of co-construction is only considered for individual cognition i.e. the co-construction of knowledge in the participating individuals, without involving the aspect of co-construction by the group as a whole.

As proposed earlier, the observation of the co-construction of individual cognition is always a tricky activity. In several cases I could not observe any co-construction of knowledge by the individuals (as the co-construction has not been explicated by the utterances or words). Due to this apparent absence of co-constructed dialogues, in most of the cases the learning environment appeared to be an ineffective social learning environment, although it is possible that the

participants benefitted from the interactions and developed new knowledge without acknowledging it in the practice situation. From the observation, it looked as if the group knowledge was confined to the initial phases of interactions, like sharing of information and discovery and exploration of dissonance, and the actual co-construction, if it occurred at all, happened outside the learning environment. In other words, this model was not well defined for determining the actual effect of discussion on learning.

This model can only be used to capture the dynamics of those learning environments where the knowledge construction process is much more inclined towards the normal socio-cultural learning where the benefits of interactions can only be achieved if the interlocutors are interested in the further negotiation of the concept. However, in terms of the 'collaborative learning framework' described in Chapter three, for the effective analysis of the collaborative interactions, there is a need for analysing the learning both at individual as well as at the group level. As a consequence, the creation of knowledge gain especially at the group level should be demonstrated through the production of a tangible group artefact. Therefore apart from the theories of social cultural, socio-constructivist learning, or shared cognition theory it is valuable to include the additional component of constructionism. Gunawardena's model might be built on existing theories of 'learning within a group'; however, this model does not embrace the idea of 'learning by a group' as a whole, therefore the concept of assessing the overall 'group cognition' is missing in this model. In fact, this model cannot provide sufficient support for identifying accurately the progress of collaborative interaction in the asynchronous discussion forum. Therefore, as an obvious consequence in order to make a precise alignment between the 'collaborative learning framework' and the content analysis scheme, Gunawardena's model was abandoned for the purpose of analysis in this research, and a new model was chosen for the further Case Studies.

5.23 Murphy's model

In order to translate into practice the fundamental theoretical assumption of collaborative learning as a 'coordinated synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of a problem'

(Roschelle and Teasley, 1995, 970), specific measures must be taken to ensure that this feature of collaborative learning is taking place.

Therefore as highlighted by Murphy (2004), promoting collaboration in online learning begins with an understanding of the concept itself, followed by an understanding and recognition of how it might manifest itself in an online context. Subsequently a process of identification and measurement of its presence could be helpful to determine the nature of interaction, especially to track down its destination towards effective collaboration. In practice, this process tracking mechanism can provide the information about the support as well as the scaffold which is necessary to transform the learning environment from a simple discussion based practice situation to a productive collaborative interactional space.

In the model designed by Murphy (2004), the theoretical framework of the instrument includes the aspect of the production of shared artefact as the end result of any productive collaborative interaction. In this model, Murphy hypothesised that collaboration can only be realised at the stage when the shared artefact results. Unless a new output of the group has been envisioned, created and negotiated through discussion, the effective process of collaboration cannot be completed.

It is commonly highlighted in the literature that before selecting a specific instrument for analysing the data, it is important to consider that there should be a clear link between the theoretical framework and the instrument. In this specific empirical research, it has been proposed as the conceptual framework that the overall process of 'shared meaning construction' in the collaborative environment cannot be assumed to be an expression of mental representations of the individual participants, it is better to consider it as an interactional achievement. Within the specific setting of the collaborative plane, the emergent conceptions would be analysed as a group product supporting the concept of the shared cognition approach (Suchman, 1987; Lave, 1988). There is an explicit alignment between the theoretical positions suggested by Murphy in her model and the conceptual definition of collaborative learning adopted in this research.

Therefore, in this project I have used an interactional model which is highly influenced by the existing model designed by Murphy (2004). The online asynchronous discussion used in the development of the original instrument and subsequently analysed was drawn from a Web-based learning module called Solving Problems in Collaborative Environments (SPICE) (Murphy, 2000). Eleven pre-service teachers of French as a second language used the module during a four-week period in an undergraduate methods course. The module was delivered in a WebCT™ environment.

In this model, the recognition of collaboration in the context of an asynchronous discussion forum involves identifying instances and manifestations of a range of processes along a continuum ranging from social presence to the production of a shared artefact. Moreover, recognition also involves identification of individual indicators of the different processes ranging from sharing personal information to sharing goals and purposes (Murphy, 2004).

5.3   Applying Murphy's model

Collaboration begins with interaction. In the collaborative learning environment, participants show awareness of each other's presence and begin to relate as a group. A key element at this stage is what Garrison et al., (2000, p. 4) define as social presence: 'the ability of participants in the 'Community of Inquiry' to project their personal characteristics into the community, thereby presenting themselves to the other participants as "real people"'. Social presence creates group cohesion, which enriches interaction. When a sense of community is formed through communicating on a social rather than just an informational level, interaction can move to a higher level and become collaborative (Henri, 1992; Garrison et. al., 2000).

Interacting with others, then, may be seen as a first step towards collaboration, but as discussed earlier, collaboration involves more than peer-to-peer interaction. In a collaborative asynchronous online discussion, participants may begin by introducing themselves, and then move on to articulating their individual perspectives. In this stage, participants are aware of the presence of others, but do not explicitly reference their perspectives or solicit feedback from them.

According to Henry (1995), postings at this stage, may read like a series of monologues. If collaborative learning combines the aspects of individual as well as group learning, then this step is the first one responsible for developing the new platform for the individual to open up their cognitive system for further revision and refinement. This step can provide the opportunity to the learners to reflect on their previous experience as well as to bring back some specific skills/ competencies acquired in different context which might be helpful for others to create a new knowledge base.

At a next stage, as participants are exposed to each other's viewpoints, they begin to accommodate and reflect the perspectives of others (Henri, 1995; Knuth and Cunningham, 1993; Jonassen et. al., 1993). This stage is a prerequisite towards building knowledge and constructing new meanings (Garrison et. al., 2000; Schrage, 1995; Alexander, 1992; Henri, 1995). For the co-construction of a unified knowledge, collaborative community or group members not only share perspectives, but also challenge and refine those perspectives. As participants articulate and externalise their perspectives, areas of disagreement or conflict become explicit. This process of questioning, evaluating and criticising perspectives, beliefs and assumptions allows participants to restructure their thinking (Steeples et. al., 1994; Brown and Palincsar, 1989). According to Piaget's theory of constructivism, this is the first stage when the individual cognitive system is actually changed via differentiation and integration. And it is expected that for the cognitive system to be revised, gaps in meaning-making and perturbations must be incorporated into it. This incorporation will lead to revision of the cognitive system, which might be categorised as the co-construction of new knowledge. Similarly from the Vygotskian perspective, in this phase the process of internalisation could be facilitated as an effect of social scaffolding in the practice environment.

In practice, when individuals' perspectives are challenged (when some sort of conflict or disagreement arises), the participants must work together to produce shared meanings (O'Malley, 1995). In this context it is important to highlight that, in case of any argumentation in the academic environment, the students often take the 'least line of resistance' in argumentation (Dillenbourg et. al., 1996), shifting focus to some minor point on which they have agreed, and thus never

really resolving the conflict (Baker, 1991). Therefore, as far as the cognitive effect of argumentation is concerned, this type of situation might raise the question posed by Mevarech and Light (1992, p.276): "Is conflict itself sufficient as an "active ingredient", or is it the co-constructed resolution of such conflict which is effective?" From this point of view it is important to support the mechanism of conflict resolution for shared meaning which can only be achieved by further negotiation or mutually work together for a shared goal.

Therefore while working in a collaborative learning environment, initially the group members develop social presence, then gradually they articulate, accommodate and co-construct new perspectives and meanings, however to achieve the distinctive learning outcome of the collaborative situation, they also work together to achieve shared goals (Roschelle and Teasley, 1995). When individuals reach a stage at which they share goals, a sense of common purpose emerges. It is at this point that individuals work together and begin to move in unison towards a common direction. 'To collaborate (colabore) means to work together, which implies a concept of shared goals' (Kaye, 1992, 2). Sharing goals can lead to the production of a shared artefact, 'an explicit intention to "add value"— to create something new or different through the collaboration' (ibid.).

Collaboration ultimately is realised at this stage when the shared artefact results. Until this 'something new' has been envisioned and created, collaboration is not properly complete. As Schrage (1995, 29) argues, 'collaboration is supposed to produce something'. Its success, he claims, 'can be measured by its results' (p. 30). As discussed earlier according to the theory of social constructivism the impact of social interaction on individual knowledge construction can only be determined if the individual learning can be separated by an intervention session in which participants worked either alone (control condition) or in pairs. The results from this pre and post test analysis could provide the idea that how far the social dimension of the situation could be seen as providing the impetus towards or catalyst for resolving the conflict for the development of knowledge.

Similarly according to the microgenetic methodology proposed by Vygotsky (1978), the effect of social scaffolding on individual cognition can only be assessed if there is a clear involvement of three separate occasions. First, the person is studied when working alone to establish a baseline, then working in the

company of a more competent other person who provides assistance, and finally when working alone again. The third phase of the investigation provides a measure of the degree to which the person has internalised key aspects of the joint problem solving session. Primarily all these assessment criteria clearly highlight the significance of the measureable outcome of the social interaction in the learning environment.

Although these recommendations are generally made for the individual learning, the same concept can easily be applied to the collaborative setting if the collaborative groups can be considered as a single cognitive system. According to Stahl (2006) the measureable outcome of the collaborative interaction could be a knowledge artefact such as a verbal problem clarification, a textual solution proposal, or a more developed theoretical inscription that integrates participants' different perspectives on the topic and represents a shared group result that they have negotiated. Practically this final stage of collaborative learning combine Piaget's, Vygotsky's as well as Wenger's theory of social learning with the principle of constructionism. Through the production of knowledge artefacts , the learners not only explicitly exhibit their conceptual change due to the discussion in the theory level, but also this sort of artefacts can motivate them for further discussion through their reflection and interpretations of what happened within their practice. In other words it might create another iterative cycle of communication specifically in the practice level. Moreover this completion phase supports the idea of defining the theory of collaborative learning as a combination of social learning with constructionism (Laurillard, 2009).

Therefore according to Murphy, the whole process of collaboration is defined in terms of a continuum along which six major processes or stages can be identified. The continuum moves from mere interaction towards what Schrage (1995) refers to as a 'purposive relationship', which leads to the production of a shared artefact. These six processes are:

1. Social presence(S).
2. Articulating individual perspectives (I).
3. Accommodating or reflecting the perspectives of others (P).
4. Co-constructing shared perspectives and meanings(C).
5. Building shared goals and purposes (B).

6. Producing shared artefact (A).

To summarise, two distinctive levels of discussion might be expected from Murphy's proposed model:

- The content level discussion with sub-categories I, P, C and A
- The meta level discussion with sub categories S and B.

These six consecutive steps embrace the personal as well as the social cycle of knowledge building in the overall collaborative process. These steps clearly highlight that, through the interactions in different steps, the original suggestions made by individuals could be transformed; through broadening consensus, the resultant expression increasingly takes on the status of socially established knowledge. In these steps 'knowledge negotiation' can be conceptualised as the group knowledge building process. According to these six steps, in the context of collaborative learning the individual knowledge construction is dependent on knowledge negotiation with others present in the social setting. The whole process of knowledge development is not only selecting among alternative existing states (propositions, proposals, activation functions) but also of constructing new knowledge through collaborative interaction and discourse. The new knowledge is therefore typically represented by or embodied in a shared 'knowledge artefact' such as a concept, theory, text, or folder of structured information (Stahl, 2006).
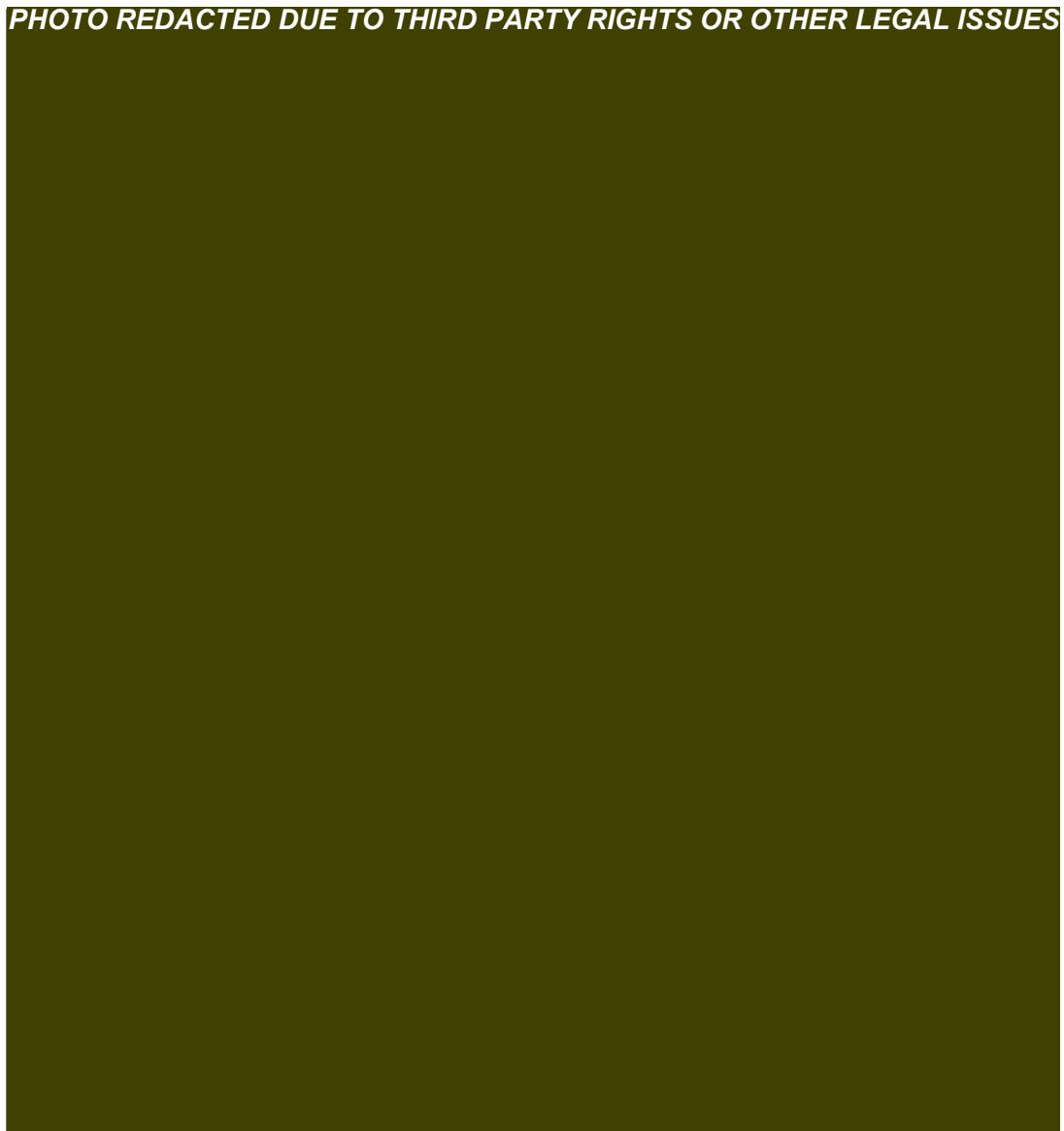
Figure 5.1: The model of collaboration by Murphy (2004)

Figure 5.1, presents a model of collaboration (Murphy, 2004), conceptualised as a series of processes or stages that move from interaction to collaboration. According to this model, the earlier processes are prerequisites for the later ones: the highest levels of the model cannot be reached without moving through the lower levels. However, participation at the lower levels does not guarantee that the higher levels will automatically be reached. Simple interaction is a necessary prerequisite to achieve collaboration, but simple interaction may occur without ever moving forward to higher levels of collaboration. Therefore to make the collaboration effective there should be an engine of motivation that will keep the

learners engaged continuously in the goal-action-feedback–reflection-adaptation-revision cycle (based on conversational framework proposed by Laurillard, 2002).

5.31 Development of the content analysis instrument

The six consecutive steps described in the model of collaboration serve as a basis for the initial development of an instrument which could assist in the identification and measurement of collaboration in the asynchronous online discussions. The model's six processes also serve as the main categories for the instrument. In this instrument, considering the six processes as a framework, specific indicators have been designed for each of these six processes. The indicators can be used to identify the types of statements participants made in their postings – for example, posing a question, sharing information about oneself or disagreeing with another participant. After categorising all the statements, each discussion thread can be scored according to the major processes they demonstrate.

These six categories and the associated indicators can effectively be used to gain insight into the collaborative processes in which discussants in an OAD (online asynchronous discussion) do or do not engage. Models and instruments using these categories and indicators can serve to recognise the presence or not of genuine collaboration. In practice, this recognition is a prerequisite to being able to promote collaboration in the context of OADs.

Therefore for the content analysis to identify whether collaboration has taken place or not, each message (as the unit of analysis) within each conversational interaction (the individual threaded discussion) should be identified and categorised according to the six different phases of the collaborative process.

However, in Murphy's original model, the six different phases of collaboration used 23 different indicators. This set of categories had not been tested in terms of inter rater reliability in the original study. In the current study it was piloted in its original format, but achieved a low value of inter-rater reliability, mainly because there were too many indicators in the model, creating confusion due to the overlapping of certain indicators. Therefore it was important for this study to

create more reliable and simpler set of categories for using Murphy's model. The original categories and the revisions for this study are outlined below.

- **Social presence (S)**

1. Sharing personal information. (SP)
2. Recognising group presence.(SR)
3. Complimenting/expressing appreciation towards other participants.(SC)
4. Expressing feelings and emotions. (SF)
5. Stating goals or purposes related to participants. (SG)
6. Expressing motivation about project or participation. (SM)

It is true that there are many aspects of emotional engagement, self-esteem, humour, motivation, interest, etc, that affect what and how students learn. However in this research, considering its scope, I am not interested to show the impact of social interaction on effective collaboration. The research interest is much more inclined towards assessing the cognitive dimension of collaborative interactions. Here only this category of 'social level discussion' would be used to differentiate the specific type of messages from the rest of other categories. Therefore the indicators should only be used to identify the nature of the messages, and for the inter rater reliability issue, the messages would only be compared as the category S not by their respective indicators.

For the next category, five indicators have been suggested in the original model.

- **Articulating individual perspectives (I)**

1. Statement of personal opinion or beliefs which itself makes no reference to perspectives of others. (IV)
2. Summarising or reporting on content without reference to the perspectives of others. (IS-)
3. Summarising or reporting on content with reference to the perspectives of others. (IS+)
4. Introducing new perspectives. (IN)
5. Posing rhetorical questions. (IQ)

However in the edited version, only one indicator has been defined to embrace all the sub-categories:

- Statement of personal opinion or beliefs based on individual experience or learning (IV)

The next category had five subcategories in the original.

- **Accommodating or reflecting the perspectives of others (P)**

1. Directly agreeing with statements made by another participant. (PA)
2. Directly disagreeing with /challenging statements made by another participant. (PD)
3. Indirectly disagreeing with/challenging statements made by another participant. (PI)
4. Co-ordinating perspectives. (PC)
5. Sharing information resources. (PIR)

However in the revised model only two indicators have been defined, as

- 'Direct agreement' (PA) and
- 'Disagreement' (PD)

It is expected that under any circumstance, when participants accommodate the perspective of others, evidently, it would result in the two possible solutions, either agreement or disagreement.

The next category has seven subcategories.

- **Co-constructing shared perspectives and meaning (C)**

1. Asking for clarification/elaboration. (CA)
2. Proposing elaboration or extension or some alternative suggestion. (CE)
3. Soliciting feedback. (CF)
4. Provoking thought and discussion. (CP)
5. Responding to questions. (CR)
6. Sharing advice. (CS)
7. Constructing through reflecting on the views of others. (CCR)

In this category one indicator "Constructing through reflecting on the views of others (CCR)" embraces all the others. According to Stahl (2006), in any social learning environment when someone's personal belief is articulated in words, generally this public statement is taken up by others and discussed from the

multiple perspectives of several participants. However after this prolonged discussion someone might want to modify the existing cognitive system for a new understanding. Especially the phase of incorporating multiple perspectives might include the factual analysis, comparison and reorganisation of ideas with a view to defending and evaluating arguments. Therefore the whole process of cognitive restructuring might be reflected in the dialogue in the single subcategory:

- Constructing through reflecting on the views of others (CCR).

The next category has only two subcategories in the original model.

- **Building shared goals or purpose (B)**

1. Proposing a shared goal or purpose. (BP)
2. Working together towards a shared goal. (BW)

According to the literature, the whole process of collaborative interaction is based on its assumption of the existence of 'shared goal' within the practice environment, still one cannot simply assume that partners have completely shared goals, even if some external agent (like the tutor) fixes this goal (Dillenbourg et al,1999). Shared goals can only be partially set up at the outset of collaboration; they have themselves to be negotiated. Along with this negotiation of shared goal there could be additional mode of discussion through which the participants could decide the effective process to follow in order to accomplish the collaborative task.

As proposed earlier if the aspect of co-ordination is accountable for the efficacious execution of the collaborative task, then there could be the expectations of another iterative course of conversations which can be classified as the organisational level discussion. In practice, the dynamics of collaborative learning should be based on horizontal perception of learning where power should be distributed equitably among the group members, as opposed to the traditional hierarchical view of authority. Therefore, even in the organisational phase of discussion, the strategic suggestions by the co-ordinators need to be negotiated with others in order to attain the resultant outcome of group agreement. The proposition of Conversational Framework, the goal-action-feedback-revised action once again is very much relevant in this level of discussion. The transition from the initial planning of task to the final strategic approach can only be

achieved if the process involves the idea of accommodating the feedbacks of all the participating individuals.

In Murphy's model this organisational level of discussion is not quite captured in a significant way. The indicator 'working together towards a shared goal' under the category of 'building shared goals and purposes', can be explained in two different ways. First, it might be interpreted as the essential actions to complete the collaborative task, and second it could be considered as a process of negotiation necessary for producing the artefact. However in these two different interpretations, two different types of cognitive activities are involved. For the organisational aspect, the meta-level communication is necessary whereas for the production of a shared artefact, higher order cognitive mechanisms are involved. Therefore, in order to differentiate between these two possible approaches associated with the productions, the meta-level communication is better to term as *organisational level* discussion, and the negotiation evolving around the practice/artefact can be termed as *practice level* **discussion**. In fact, from the perspective of the effective collaboration, an adequate interface for the negotiation dialogue is needed, in which students can formulate, exchange and react to disagreements so that the knowledge artefacts can be modified in a direction that is likely to promote consensus (Stahl, 2006). In practice this referential network of dialogues could be labelled as the practice level discussion.

For that reason, in this category, the indicators are defined as,

- Proposing shared goal or purpose (BP)

and 'working together towards a shared goal (BW)' could be subdivided into two different levels,

- Organisation level discussion and
- Practice level discussion

In practice the organisational level discussion could be composed of messages with categorised codes as follows:

1. Proposing an approach/plan to accomplish the collaborative task (BW/P)

2. Agreement or disagreement statement to the proposed plan (BW/A or D)

3. Alternative suggestion/plan to carry out the proposed task (BW/AS)

4. Mutual consensus/ agreement to the final plan (BW/MC)

And the practice level discussion could be composed of the similar categories of cognitive mechanisms, with associated codes of this category as follows:

1. Articulation of individual perspective on the practice (BW/ IV)

2. Accommodating the views of others on the practice (BW/ PA or PD)

    - where PA is direct agreement, PD is direct disagreement

3. Co-constructing shared views or meaning through practice (BW/ CA or CE or CF or CP or CR or CS or CCR)

    - where CA is asking for clarification; CE is proposing elaboration, CF is soliciting feedback, CP is provoking thought and discussion, CR is responding to question, CS is sharing advice, CCR is constructing through reflecting on the view of others).

The final category had only on subcategory in the original model, which is therefore the category to be used in this analysis.

- **Producing shared artefacts (A)**

    1. Document or other artefact produced by group members working together (AD)

Therefore in a nutshell, this proposed modified model of Murphy now consists of six different categories similar to the original one, although the fifth category 'building shared goals and purpose' has been divided into two major subcategories of ' organisational' and 'practice level' discussion for the better alignment with the 'collaborative learning framework' discussed in Chapter three.

5.4 The limitation of Murphy's model

The process of collaborative interaction, suggested by Murphy (2004), indicates that, any social learning environment with the existence of shared artefact can easily be labelled as the collaborative one. Or in other words the presence of six

consecutive steps in any social learning environment with certain cognitive activities could be enough to recognise the presence of collaborative mechanism.

In this context it is important to mention that, in practice there is a very slight difference between the simple discussion (the normal social learning environment) and collaborative discussion, as far as the mechanism of knowledge construction is concerned. In both of these contexts, the general expectation is that the knowledge should be created through the negotiation of certain concepts / beliefs within the boundary of social environment. The cognitive mechanism like elaboration, explanation, question asking or argumentation can exist in both of these learning environments. Therefore if we consider the categorisation like articulation of individual perspective, accommodating the perspective of others or co-constructing shared perspective (which might be considered as the objective of any productive discussion), mainly the categorisation in the content level discussion could be similar in both of these cases. However in case of collaborative learning, it is not only important to measure the impact of cognitive mechanisms on individual understanding, the principal focus should also be to identify the group understanding. And from that perspective, because of this specific attribution of collaborative learning, it is quite logical to include the category of B (building shared goal and purposes) and A (producing shared artefacts).

However, an important aspect of analysing the productivity of collaborative learning is to measure the move from assimilation to construction (Schwartz, 1999). And in practice this sort of assessment, should be extended to the group level, as the sole assessment in the individual level is not sufficient in describing the building of shared understanding.

Therefore as far as the development of group cognition is concerned, it is essential to identify the shared artefact, which has been created by the participants through a common negotiation. And specifically for that production, the participants could be considered as the co-authors and share holders as it has evolved only through the process of interpersonal meaning making (Stahl and Hesse, 2007). Rommetveit (2003) uses shareholders and co-authors as metaphors in order to describe a situation in which knowledge and understanding are socially distributed amongst people. Rommetveit labels this situation as a two-sided act where ''word

meanings are thus neither in a speaker's head nor in a dictionary. They are established dialogically under the influence of the situational context and the perspectives taken by the interlocutors – constructed by the speaker and the listener in a collaborative process, which means that both the speaker and the listener have a share in them" (p. 193). However the participants can only be described as the co-author or share holder of the shared artefact if the entire process of producing artefact involves the inclusion of multiple feedbacks coming from the various iterative phases for the production of the final one. Considering the Conversational Framework proposed by Laurillard (2002) the goal-action-feedback-reflection-adaptation-revised action is not only applicable to measure the effect of collaborative interaction in the individual case, it has the same implication for the group as well. Therefore the existence of shared artefact in the practice environment is not the single criterion to label the learning situation as a collaborative one. It is also important to analyse the quality of the production. Even the presence of certain cognitive activities (like elaboration, explanation, question asking etc) cannot guarantee the effective collaboration unless their individual effect is included as feedback in order to produce a higher quality shared artefact as the revised action. From this perspective, apart from identifying the six consecutive processes of collaborative interactions (as defined by Murphy) it is important to analyse critically the process of group meaning making from the qualitative point of view.

Therefore, Murphy's categories could be used for two different significant purposes. First to make an explicit distinction between the socio-cultural learning and collaborative learning and second in two very different instances of collaboration, one very successful, very high quality and the other very poor quality. Although this sort of categorisation is not a part of Murphy's original model, still in this research project, in both of these circumstances, the quality would be measured by using the Conversational Framework for identifying the actual co-construction by group through the reflection in the revised action (the ultimate shared artefact).

Therefore, in conclusion, Murphy's original model with its associated categories and the indicators are clear enough to encapsulate the gradual phases of knowledge construction in the collaborative situation. However to capture the

quality of different collaborative interactions, more attention should be paid to those processes (like the practice level discussion) which can explicitly reflect the gradual change of group cognition due to collaborative interactions. Without this consideration, Murphy's model could be limited only to 'recognition' of collaborative interaction by the identification of certain steps, whereas the modified model can provide a more 'in depth exploration' of the dynamics of the collaborative knowledge building process to ascertain the quality of the learning outcome.

5.5   Coding and reliability

As mentioned earlier in Chapter four, De Wever et al., (2006) has proposed in their article that, content analysis instruments should be accurate, precise, objective, reliable, replicable and valid (Neuendorf, 2002; Rourke, Anderson, Garrison, & Archer, 2001). However these qualities can only be acquired if specific considerations have been taken into action while formulating the content analysis scheme. In terms of Rourke et al., (2001), four major criteria should be taken into account for this purpose, like identifying the purpose of the coding scheme, identifying the behaviours that represent the construct, reviewing the categories and indicators, and gathering empirical evidence for validity.

Therefore, the first step in developing a coding protocol is to identify the purpose for which the coding data will be used. In this research project the research question as well as the theoretical proposition is focused on to uncover the mechanism of learning in the collaborative situations which can only be explored by analysing the pattern of communication happening in the context of asynchronous online discussion.

Secondly, it is quite important to identify the behaviours that represent the construct. At this point, it is important to recall the suggestions by Rourke et al., (2001) that a coding protocol neither leaves out behaviours that should be included, nor includes behaviours that should be left out. Here (in the interactional analysis model), the origination of the coding indicators is the result of a mutual process of literature review as well as the preliminary analysis of the transcript data.

Thirdly, the categories as well as the indicators have been reviewed by two experts for the establishment of content validity. Initially my supervisor, Prof. Diana Laurillard, acted as the initial pilot for the coding categories to enable me to refine their description before testing the inter-rater reliability with an independent judge (the detailed description has been provided in the previous section, 'development of the content analysis instrument').

For the establishment of inter-rater reliability, I worked closely with the other expert who is an experienced researcher in the Open University, U.K. Their reviews as well as their subsequent feedback were used to assess the intelligibility of the provisional coding categories and indicators, and to determine their relevance and representativeness, as well as testing the reliability of the coding.

Finally, the primary test of objectivity in content studies is inter-rater reliability, defined as the extent to which different coders, each coding the same content, come to the same coding decisions (Rourke et al., 2001).

Potter & Levine-Donnerstein (1999) regard reliability data as an important part of content reports and offer the following advice: "If content analysts cannot demonstrate strong reliability for their findings, then people who want to apply these findings should be wary of developing implementations" (p. 258).

The simplest and most common method of reporting inter rater reliability is the percent agreement statistic. This statistic reflects the number of agreements per total number of coding decisions. Holsti's (1969) coefficient of reliability (C. R.) provides a formula for calculating percent agreement:

C. R. = 2m / (n1 + n2)

Where: m = the number of coding decisions upon which the two coders agree

n1 = number of coding decisions made by rater 1

n2 = number of coding decisions made by rater 2

In order to specify the coefficient of reliability, 483 coding decisions (using the threaded discussions, composed of 66 messages, in the 'Activity 3, group 4' of the course 'Development Education', used in Case Study two) have been made upon which the two coders (the researcher and the other independent coder) have

agreed. Among them 7 coding decisions made by the rater 1(the researcher) and 4 coding decisions made by the rater 2 (the independent coder).

Applying the formula of Holsti (1969), the coefficient of reliability would be,

C.R. = 2 x 483 / (7+4) = 966 / 11 = 87.818 (where m = 483, n1 = 7 and n2 = 4).

For percent agreement figures, Riffe, Lacy, and Fico (1998) state that, in communication research, "a minimum level of 80% is usually the standard" (p. 128).

Therefore, the value of the percentage agreement almost in the range of 88% implies the higher rate of reliability of the coding scheme used in the interactional analysis model.

Lastly, a definite test of a coding scheme is replicability. Here Rourke et al. proposed that, Reliable application of a coding scheme by researchers who are not involved in its creation would be a convincing testament to its efficacy. Exactly like Newman, Webb, and Cochrane (1995) and like Howell-Richardson and Mellar (1996), it can be indicated that this study is proposing an invitation to other researchers to apply and improve upon my protocols. Or in other words as the replicability of the method is related to its application in other empirical situations, therefore I am inviting others to test my methods in practice.

5.6 Conditions for effective collaboration in asynchronous online discussion

The fundamental objective of this research study is to make it explicit for the tutors to recognise the process as well as the quality of collaboration taking place during the online asynchronous discourse. Here, all the cases under investigation have used more or less the same technological facilities, and a similar number of participants in groups. And most importantly all the participants had more or less same level of cognitive development in each individual Case Study (according to the empirical study by Kuhn, 1972, collaboration does not benefit an individual if he or she is below a certain development level, however in these cases we can assume more or less the same cognitive attainment as there are always a clear expectation of their previous qualification as well as their experience in relative

field before starting a specific course). Therefore as a significant contextual factor it is important to analyse how the tutors have translated the practice of collaborative dynamics into a real online learning environment. However, observation solely based on a particular theoretical model could overlook what makes a collaborative situation special. Therefore additional attention should be paid to explore other factors while working with the data and those findings are reported in the Case Studies.

Therefore as a significant condition for effective collaboration the 'tutor role' could be measured by considering a model proposed by Anderson et al., (2001). These authors introduce the concept of 'teaching presence', which they define as 'the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes' (2001, p.5). Three main categories of Anderson's model are:

➢ Design and organization;

➢ Facilitating discourse; and

➢ Direct instruction.

As in the content analysis scheme, here also it is important to consider certain attributes or specific characteristics of the messages posted by the tutor in order to accommodate them under three main categories. The following section sets out the detailed description of the indicators which have been originally proposed by Anderson et al., (2001). However, in this context it is important to mention that, the indicators are adopted only at that stage when the whole transcript of the discussion, especially the postings made by the tutors are critically evaluated against this framework to accommodate the different characteristics of the messages.

5.61 Anderson's model

A. Design and organization

- Setting curriculum
- Designing methods
- Establishing time parameters
- Utilizing medium effectively

- Establishing netiquette

B. Facilitating discourse

- Identifying areas of agreement/disagreement
- Seeking to reach consensus/understanding
- Encouraging, acknowledging, or reinforcing student contributions
- Setting climate for learning
- Drawing in participants, prompting discussion
- Assess the efficacy of the process

C. Direct instruction

- Present content/questions
- Focus the discussion on specific issues
- Summarize the discussion
- Confirm understanding through assessment and explanatory feedback
- Diagnose misconceptions
- Inject knowledge from diverse sources (e.g. textbook, articles, Internet, personal experiences)
- Responding to technical concerns.

Although the evaluation of the task design would be one of the prime interests for the exploration of its impact on the effectiveness of collaboration, still this factor might be included within the role of tutors (as proposed by Anderson et al., 2001) as it is one of the prime responsibilities of the tutors to design the effective collaborative learning situation.

As mentioned earlier in one of the recent articles by Laurillard (2009), one framework has proposed mainly based on the Conversational Framework, where also different responsibilities or the roles of the tutors have been projected through a simplified representation. In fact this representation also identified the similar characteristics of the role of the tutors as proposed by Anderson et al., (2001).
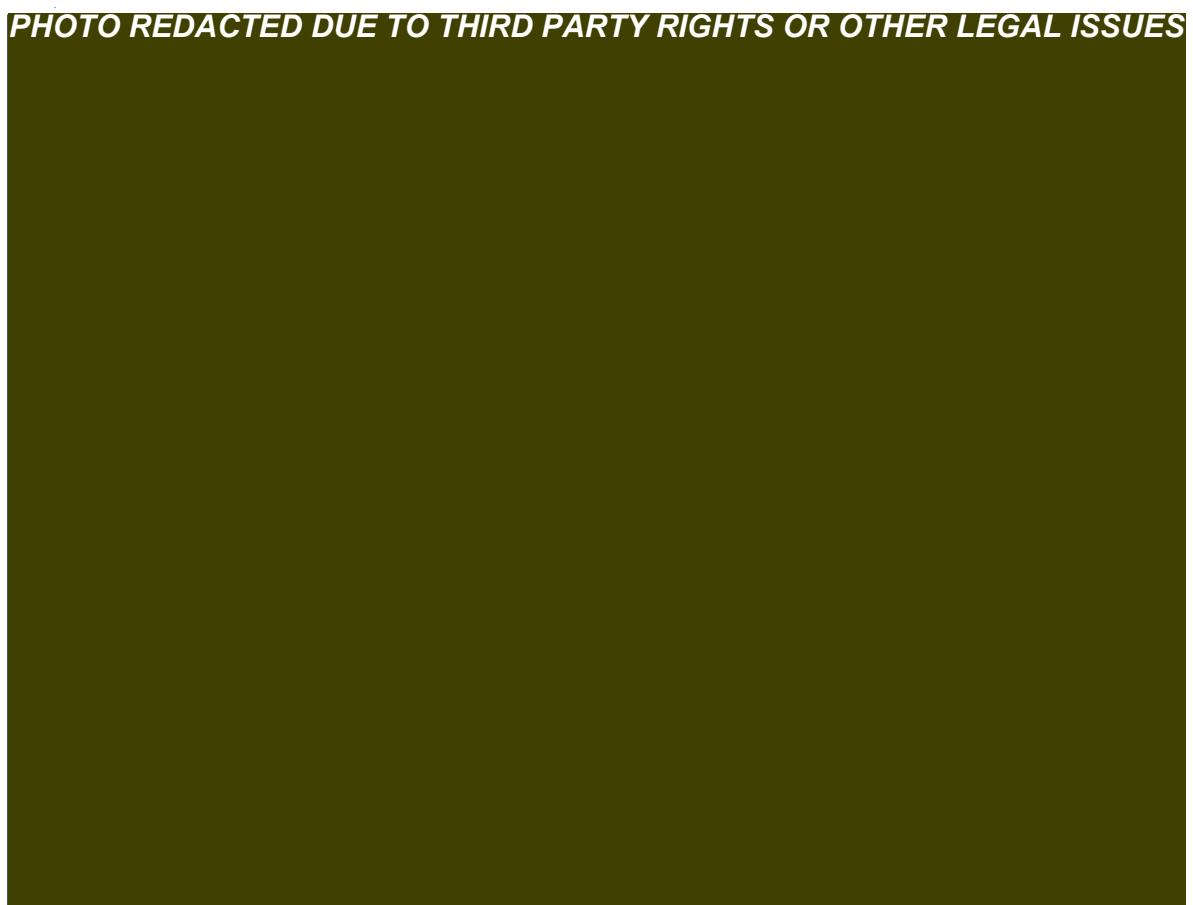
Figure 5.2: The role of the tutors in the collaborative learning situation in terms of Conversational Framework suggested by Laurillard (2009, p.11).

In fact, in the overall process of collaborative interaction, the tutors role can be reflected through three different phases (Lim and Cheah, 2003), one at the phase of pre discussion, which might be categorised as the design and organisation phase, as it is necessary to gain the attention and focus of the students as well as orient them towards the topics of the online discussion forum.

The second stage might be considered as the 'during discussion stage'. It is quite interesting that in most of the literatures specifically where the roles of the tutors have been explored, have paid serious attention for this particular phase. In fact in an article by Mazzolini and Maddison (2007), on the role of the tutor, they have suggested that, the instructors' role in the asynchronous discussion forums can vary from being the sage on the stage, to the guide on the side or even the ghost in the wings. Although in particular they did not talk about the collaborative situation, but as the asynchronous discussion forums are often being considered as the place for facilitating the aspect of collaborative interactions, therefore it would be logically sound if it is being considered that the similar role might be expected

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even for collaborative interactions. And in practice, these certain characteristics of the role of the tutors are focused mainly for their expected roles in the phase when the actual discussions are supposed to take place among the participants, or their role in the phase which has been already termed as 'during discussion stage'. From the descriptions or the nature of attributions suggested by Mazzolini and Maddison, it is quite clear that, at this phase the instructors should be the facilitators who can act as a cheerleader, attempting to motivate students to go deeper and further with the learning materials.

And finally there could be another phase, which might be considered as the 'post discussion stage'. Categorised in the model by Anderson et al., (2001), as direct instruction, in the phase of post discussion stage, the tutor can provide the direct instruction rather than facilitation, by providing appropriate and useful feedback which can allow the participants to evaluate the learning experience. Although the post discussion phase is not the only stage where the tutors can provide the direct instruction, as the overall collaborative interactions are supposed to be guided towards its intended outcome, therefore in order to maintain the objective of the discussion, even in the phase of 'during discussion', the tutors can guide the direction of the interaction by directly being involved with prescriptive suggestions.

From this discussion, it is quite evident that the model by Anderson et al (2001), can embrace the various responsibilities of the tutors in order to deliver the effective interaction in the process of collaborative interactions.

5.7   Conclusion

As proposed earlier, the sole objective of this research is to unpack the mechanism of knowledge construction happening inside the boundary of the asynchronous discussion forum, which is often referred as the collaborative environment.

Therefore, from the research perspective, the use of the content analysis scheme is equivalent to the generic approach of conversation analysis, although some adaptations have been considered in the content analysis scheme compared to the true application of the conversation analysis. As projected by Stahl (2005), the messages are typed, not spoken, so they lack intonation, verbal stress, accent,

rhythm, personality. Additionally, the participants are not face-to-face, so their bodily posture, gaze, facial expression and physical engagement are missing. In this context, the participants exchange textual postings. And in practice, the posting itself, is the singular basis for interaction, communication, mutual understanding and collaborative knowledge building within the boundary of collaborative environment.

As a result, the careful analysis of the messages aims to identify evidence of the intersubjective learning (Suthers, 2006), which is distinctively different from the objective of a merely information sharing conception of social learning. Here, it would be expected that the production of the collaborative knowledge through the intersubjective learning would be accomplished by a simultaneous process of mutual constitution that may involve disagreement as well as agreement about shared information (Matusov, 1996), within a "polyphonic nonharmonious concert characterized by synchronic movements, as well as by distinct, conflicting, and dissonant voices" (Smolka, De Goes, & Pina, 1995; Wegerif, 2006). And in practice, in this study, the coding scheme, its main categories and the subsequent indicators have designed in a way to capture this specific character of intersubjective learning of collaborative situations.

However, it is true that the use of coding scheme would be advantageous to obtain the quick indication of the learning dynamics of the practice situation, although it cannot directly analyse the accomplishment of intersubjective meaning making. Therefore, along with this categorisation, there should be detailed analysis (by applying the descriptive approach) which could examine the structure of specific interaction. And at the same time, as projected by Stahl (2005) and Suthers (2006), in case of mere descriptive studies if we focus on finding examples of how members accomplish learning, we may miss abundant examples of how they also fail to do so. However using the dual approach of categorisation and descriptive studies, we can identify systematically the presence as well as the absence of certain cognitive mechanisms in the overall collaborative discourse (by categorising the messages under different codes) and their impact on the ultimate learning outcome of the collaborative interaction (by descriptive analysis).

Chapter six: Introduction to Case Studies

6.1 Introduction

The objective of this Chapter would be the reconsideration of all the theoretical propositions which would be the anchor to analyse the data of four Case Studies. The reconsideration of that proposition advocated by Stahl ((2006), clearly discloses that in the collaborative process, the knowledge building involves the construction or further development of some kind of knowledge artefact. That is, the students are not simply socializing and exchanging their personal reactions or opinions about the subject matter but might be developing a theory, model, diagnosis, conceptual map, mathematical proof, or presentation.

Therefore, if it is considered that the collaborative learning should be characterized by the production of very tangible outcomes, then from the research perspective, it is significant to analyse the learning mechanisms as well as the learning outcome of those asynchronous online discussions which are labelled as a collaborative situation by the practioners.

6.2 Methodological issue

The shift from mental models of individual cognition to support for collaborating groups had enormous implications for both the focus and the method of research on learning (Stahl, 2010). The fundamental theoretical proposition of collaborative learning initiates a need for developing methodologies, essential for analysing and interpreting group interactions as such. The focus is no longer on what might be taking place 'in the heads' of individual learners, but what is taking place between and among them in their interactions.

During the first biannual CSCL conference, Dillenbourg et. al., (1996) analyzed the state of evolution of research on collaborative learning as follows;

> For many years, theories of collaborative learning tended to focus on how individuals function in a group. This reflected a position that was dominant both in cognitive psychology and in artificial intelligence in the 1970s and early 1980s, where cognition was seen as a product of individual information processors, and where the context of social interaction was seen more as a background for individual activity than as a

focus of research. More recently, the group itself has become the unit of analysis and the focus has shifted to more emergent, socially constructed, properties of the interaction.

Bearing in mind all these guidelines associated with the typical characteristic of the methodological issues of CSCL research, it is important to mention that, the mere representation of the number of messages associated with the six consecutive processes of collaborative interaction (according to Murphy's model proposed in Chapter five), cannot capture the complexity of learning mechanisms of collaboration which is the fundamental focus of study. The numerical representation of the behaviours of the overall collaborative discourse can portray the general overview of the practice situation, but these numbers cannot reveal the quality of the messages. Therefore, to understand the effectiveness of the collaborative process there should be representation from the qualitative data which can display the state of evolving knowledge resulted from the interaction as well as the stance of each participant to that shared and disputed knowledge.

To recapitulate: it is important to mention that the whole message is to be considered as the unit of analysis. As proposed by Gunawardena et. al., (1997), if a message is broken down into units of meaning and each unit analysed separately, it could cause a problem for describing the process by which arguments are advanced, building upon each other to support or refute propositions and negotiate meaning. A message as a unit of analysis can represent the overall structure of a participant's cognitive activity and its specific contribution to the construction of knowledge through mutual interaction. And it is also true that there could be evidence of more than one phase of collaborative interactions within a single message posted by participants.

It is also important to go through the messages sequentially. It is always possible that a discussion forum could be a composition of several individual threads. Assuming that every individual thread is a means to generate new knowledge through interactions, it is important to investigate the state of evolving knowledge at the end of individual thread, especially in terms of how the new ideas are negotiated, how the emerging issues have been resolved in the practice environment for the development of a common understanding of the concept. As all these threaded discussions are interrelated for the overall development of knowledge, therefore the quality of the evolving knowledge cannot be monitored

if specific emphasis has not been paid to analysing the knowledge development through the resolution of separate threads. However, the messages under the category of mere social interactions can be ignored in this research as it is not of primary interest to observe the relationship between the social interaction and its impact on the quality of the collaborative learning outcome.

6.3 The major considerations for the analysis of the data

To ascertain the mechanism of collaborative interactions, it is important to specify certain characteristics of the collaborative interaction as these characteristics will be the basis to analyse the threaded discussion for the evaluation of their effectiveness as collaborative learning.

- A group meaning is constructed by the interactions of the group's individual members, not by the individuals on their own. It is an emergent property of the discourse and interaction. It is not necessarily reducible to opinions or understandings of individuals (Stahl, 2005).

- The mechanism of knowledge construction in the collaborative environment can be described as an approach of 'inter subjective' learning; which can be best understood from a participatory sense as a simultaneous process of mutual constitution of knowledge (Suthers, 2006).

- Knowledge building discourse should be characterised by the progress in the state of knowledge: idea improvement. It should involve a set of commitments like a commitment to progress, a commitment to seek common understanding rather than merely agreement, and a commitment to expand the base of accepted facts (Scardamalia and Bereiter, 2006).

- The point is that for two or more people to collaborate on learning, they must display to each other enough that everyone can judge where there are agreements and disagreements, conflicts or misunderstandings, confusions and insights. Alternatively, the state of evolving knowledge must be continually displayed by the collaborating participants to each other. The stance of each participant to that shared and disputed knowledge must also be displayed (Stahl, 2006).

6.4 Task design Characteristics

As proposed earlier this research is not all about the analysis of the threaded discussion to measure its effectiveness as ideal collaborative interactions against the theoretically prescribed approach. There is an additional interest to scrutinize the role of the tutor and the role of the task design on the quality of collaborative learning outcome. In Chapter two, it has been clearly explicated that, two complementary approaches can be assumed that can influence the productive interactions of collaboration (Dillenbourg, 2002), one by structuring the collaborative process and second by regulating the interactions. In recent times these two approaches are termed as 'design based scaffolding approaches to collaboration' and 'management based approaches to scaffold collaboration' (Reimann et. al., 2006).

The management based approaches are directly related with the various roles of tutors to facilitate the process of collaboration. In that case, the role of the tutor would be classified by using the model designed by Anderson et. al., (2001), the detailed description has been provided in Chapter five.

To consider the aspect of design based scaffolding approaches to collaboration, there is a need for instructional support that guarantees a higher quality of both collaborative learning processes and individual learning outcomes (Kollar et. al., 2006). From the theoretical perspective, this sort of instructional support has been termed as 'scaffolding' (e.g., Pea, 2004; Quintana, Reiser, Davis, Krajcik, Fretz, Duncan, Kyza, Edelson, & Soloway, 2004; Reiser, 2004; Sherin, Reiser, & Edelson, 2004; Tabak, 2004), as they are primarily based on the Vygotskian concept of the zone of proximal development (Vygotsky, 1992). In the practical sense, scaffolding has been defined as a way to support learners as they accomplish tasks that they would not be able to perform on their own (Wood, Bruner, and Ross, 1976). However, as portrayed by Weinberger et. al., (2009), the individuals could have already existing expectations, a set of beliefs and a repertoire of possible actions to choose from in certain situations like collaborative environments. Therefore the collaborative learners could share some more or less elaborated knowledge on what events and activities could be expected during the learning process. In that case the guidance to the learners to act in a meaningful dynamic way is principally a particular type of cognitive

schemata which can be termed as 'internal script' in terms of cognitive psychology perspective (Kolodner, 2007; Schank & Abelson, 1977). Therefore under the category of task design one determining factor could be,

- The consideration of the internal script of the learners, i.e. the experience of collaborative learning manifested through their behaviour in the learning situation.

Therefore, depending on the novelty of the situation, learners may also have more elaborated scripts and sub-scripts, such as introducing yourself and your perspective on the task, asking questions, giving explanations, providing counterarguments, synthesising different opinions, documenting group processes and outcomes (with specific artefacts) and coming to a joint conclusion (Weinberger et. al., 2009). However, there could be situations where the learners' internal script may be less elaborated, lack specific sub-scripts or bias learners' perceptions and lead to inadequate activities with respect to the collaborative learning goals. Similarly, there could be situations where the group members are working together for the first time or whose members have little domain knowledge about collaborative learning. As an obvious effect in those situations learners should be challenged to make sense of the situation with the help of external script like there is a need for specific instructional approach or the careful guidance by the intervention of the tutors in the learning process. Therefore, the external scripts are the complement and can potentially alter learners' internal script.

Therefore, the instructional support or the issue of design based scaffolding might include various aspects which might be considered as the categories to analyse the effective task design. For example,

- Structuring the activities
- Construction of the group
- Defining the nature of interaction and the process of collaboration
- The explicit formulation of the aim or purpose of the task

In this thesis, the subsequent four Chapters (Chapter seven to ten) will be the elaborative representation of the four Case Studies selected for this empirical research.

Chapter seven: Case Study one

7.1 Case Study one

This Chapter will represent the Case Study one, which will include the presentation of the threaded discussions along with their subsequent interpretations. The main effort will focus on identifying the existence of collaborative learning mechanism in the practice situations. However as a conditional effect of collaborative learning, the task designs and the perceptions of the tutor will also be scrutinized critically as having an immediate impact on the success of collaborative interactions. The Chapter begins with the brief overview of the course as a whole.

7.2 Brief introduction of the Case: Security Management course

This is the module from a course for M.Sc in Information Security. This course addresses the major themes of Security Management, including people, processes and technology with particular emphasis on the role of policy in helping to shape an organisation's Security Management Strategy. The module is offered as a distance learning course, using Moodle – the virtual learning environment.

Activities	No of participants	Duration	No of tutor	No of messages in the thread
Activity 2	16	13-23 Oct 08	1	44
Activity 5	18	25 Oct - 07 Nov 08	1	53

Table 7.1: The general overview of the course

The data and analysis of this Case is described in the following sections.

7.3 Task design

For this course I will analyse the messages in the online discussion relating to the two interesting activities that most clearly reveal the effects of task design. These were phrased by the tutor as follows:

Activity 2: What is information Security and Information Security Management?

Design of the task: The main questions being; "What is Information Security" and "What is Information Security Management?" We then ask this question twice more at different points in the term. So, I thought we could ask this question in this module at the start to see what do you all think about these?

Activity 5: Is there such a thing as good hacking?

Design of the task: Against my better judgement, I am going to raise the question of "Is there such a thing as good hacking?" This is a topic that Richard raises in his lecture and it's a good topic because, if argued well, it shows how the technical, management and social issues interplay and affect information security management. It's too good a topic to pass up. So, let's give it a go.

7.31 The analysis of task design

Chapter six specified four characteristics of the task design that can act as an anchor to measure its expected effectiveness for obtaining the desired outcome of collaborative learning.

Given the task design for Case Study one it can be analysed in terms of the four characteristics to show that it is a minimally structured problem solving activity:

- Structuring has only been provided in terms of the topics proposed
- There is no specific instruction that constructs the groups
- Students are not advised how they should interact and collaborate
- There is no explicit formulation of the purpose or aim of the task.

Therefore, since the 'internal script' is influenced by the type of collaborative learning they enact, the students may not achieve the intended outcome of collaborative interactions, as there is no provision for the extra support that an external script could provide, and the students may not be able to construct their own internal script.

However, despite careful structuring of the task, there can still be problems of achieving the intended outcome of the collaborative interactions until and unless a clear formulation of the purpose of task is revealed to the participants. For example, from the ideal point of view the purpose of the two activities could be,

- Encourage the participants to explicate their tacit understanding of the topics for the discussion from the multiple perspectives of several participants.

If this had been the tutor's explicit purpose, the original statement made by the participants could have been more refined through an extensive discussion involving various cognitive activities, with these interchanges gradually resulting in a new understanding of the meaning. As this learning environment has been labelled 'collaborative', the final expectation would be that the interchanges gradually converge on a shared understanding resulting from a clarification of differences in interpretation and terminology. However considering the criteria of 'explicit formulation of the aim or purpose of the task' of the task design characteristics,

- If the purpose of the task or the learning aim is not explicitly specified to the participants, they could be engaged only in low level cognitive activities (like the articulation of individual perspectives or just simply accommodating the perspectives of others without any further analysis) and there is also the possibility that they might not converge on a comparable level of knowledge acquisition.

In general, in the case of Activity 2 and Activity 5,

- An attempt has been made by the tutor to define the significance of the topics for the discussion.
- The actual aim or the purpose of the discussion is not clearly expressed.

Therefore, from the apparent features of the task design, it could be concluded that the task design itself is not influential enough to achieve the effective collaboration. As the collaborative interaction is characterised by certain features and it is considerably different from the general socio-cultural learning or normal discussion based learning, therefore, by asking learners to make sense of a problem together, they could be faced with challenges of establishing common frames of reference, resolving discrepancies in understanding, negotiating issues of individual and collective action, and coming to joint understanding (Miyake, 1986; Roschelle, 1992).

However, there is no guarantee that the discussion around well-defined tasks will always result in a productive outcome. Therefore, in the literature it has been suggested that apart from providing structured activities, during the collaborative interactions the students should be guided to respond and participate in a manner from which they derive optimum benefits. In practice this signifies the role of the tutor in the practice environment. It is also possible that even without having structured and well defined activities, the tutors could compensate for this by including strategic interventions during the progression of the discourse. Therefore, the effect of task design can only be evaluated after monitoring the role of the tutors in the discussion forum. Here it is important to specify that the tutor's role should be measured by using a model proposed by Anderson et al.,, 2001, by categorising the messages posted by the tutor into three major categories: 'Design and organisation'; 'Facilitating discourse', and 'Direct instruction'. The detailed description of this model was presented in Chapter five.

The following sections analyse the messages relating to these two activities in terms of the critical characteristics of the task design, and the outcomes they achieved.

7.4 The identification of the nature of collaboration in the threaded discussions

In the process of analysis, modified Murphy's model was used to identify the existence of the six consecutive steps of collaboration in the threaded discussions in order to test the extent to which the discussion meets the criteria for being collaborative. Here, each message as a unit of analysis has been identified (the specific indicators under all major categories has used for identification, the detailed description has been provided in Chapter five), and categorised according to the six different phases of the collaborative process.

7.41 Activity 3: What is information Security and Information Security Management? Analysis of messages

In order to maintain the confidentiality of participants in this research, authors of postings are identified by initials only.

Furthermore, specific indicators have been used to express the characteristic of the messages, for example as proposed in Chapter five, the symbolic representation of IV represents the categorisation as 'articulating individual perspectives'; PA, 'accommodating the perspectives of others'; CA, 'co-constructing shared perspectives' etc.

Additionally, the total number of messages in the overall discussion forum around Activity 2 is 44. In practice it is impossible to represent all of the 44 messages in this section. Consequently, the messages are selected mainly to represent the cognitive dimensions of collaborative interactions, the messages categorised as the mere approach of social interactions are intentionally ignored as it is not the focus of research. However, the messages are presented in sequential order. In each case the quote is categorised and then interpreted for its pedagogical significance in relation to the theory.

This initial posting is the typical representation of the articulation of individual perspective in the collaborative situation.

> U: Information security as a principle deals with protecting information systems. It has fundamental aims .... of any information system. Personally I feel that it should be...........such as printed papers, optical discs etc. In other words, both tangible and intangible information assets should be protected (**Articulating individual perspectives, IV**).

The explicit representation of the tacit understanding of the individuals through words or written text is essential for knowledge building and constructing new meanings through negotiation with others.

For the joint construction of knowledge, it is valuable for the tutor to identify the inconsistency among the ideas presented by different participants.

> **Tutor**: You are right when you say there is a debate among security folks about what should fall under Info Sec. Why do you think this is so? **(Identifying areas of disagreement)**. Why can't there be a standard response? You are right when you say it should cover everything that has information on it but how do you know where all this information is stored? **(Facilitating discourse, setting climate for learning by further exploration of the concept).**

However, at the same time, it is important to specify the inconsistency in an individual's posting if there is an observable difference between the participant's own interpretation of the concept and the interpretation which is exclusively based on the abstract theoretical proposition, as this process might have a direct impact on individual attainment. In this context, the tutor's posting can be categorised as 'facilitating discourse'. Here it could be expected that further explanation by the individuals would be helpful for unfolding his tacit understanding in a clearer way, and this display of personal interpretation could facilitate the process of negotiation to establish the shared meaning of the concept.

This message might be considered another example of articulation of individual perspectives.

> U: I believe the debate will always be there about the scope of information security and it will remain somewhat ambiguous topic. While I was working as Info Sec consultant, I hardly came across any organization that had a scope that really covered everything related to information. Most of the organizations I been to had an idea that they will be better off by

having a small "IT" security unit that evolves around IT. Since the information could be stored on different media formats, geographically separate locations, various formats i.e. digital or printed, a layered approach needs to be taken to identify, classify and secure the information (**Articulating individual perspectives, IV**).

However this posting has its own significance by accommodating the aspect of experiential learning in the development of personal understanding. Referring to Kolb's learning cycle, it could be said that the whole learning process can only be completed if the process include the aspect of active experimentation of the abstract knowledge in the actual practical environment. And this testing process might be ended with the restructuring of the concept as the associated reflective observation process decides the contextual interpretation of the concept, which might be categorised as the local knowledge. From the perspective of authentic learning (Brown et. al., 1989), this sort of conceptual development is necessary for the individuals to evaluate the personal judgement against context. During the collaborative interaction, if the interpretation of the abstract concept is accompanied by the local knowledge it might provide wider authentic experiences of learning, based on reflective experience of the existing context of reality.

In terms of the conceptual framework on collaboration, once participants are exposed to each other's viewpoints, they begin to accommodate and reflect the perspectives of others which might result in the mutual agreement or disagreement.

> **N:** Since the information could be stored on different media formats, geographically separate locations, various formats i.e. digital or printed, a layered approach needs to be taken to identify, classify and secure the information. There is need, as U has indicated, to have a good & updated inventory system of all stored material of every kind (**Accommodating the perspectives of others, PA**). But how do you know where all this information is stored? (**Co-constructing shared perspectives/meaning by asking for clarification and elaboration, CA**). I do however have one question that I would appreciate input on. How do we handle information that we as humans store within ourselves. Is policy & regulations enough to protect an organization's information? Is it more a

> legal issue? Please help me out on this **(Co-constructing shared perspectives/meaning by Provoking thought and discussion, CP).**

Even when there is an apparent agreement among the participants, there could be initiative to refine those perspectives for the better understanding of the meaning. And there could be another possibility for the introduction of a different theme which should be negotiated further for including that specific knowledge element in the group's shared understanding or meaning. From the analysis perspective it is critical to focus on how the question has been addressed in the discussion forum, and how far the new proposition has been negotiated from the multiple perspectives of the individuals.

This is an interesting posting, which signifies that the participant has accommodated the perspectives of others:

> **R:** How you know where all the information is stored? Well Information Security and Risk Management entail the identification of the organisation's information assets **(Co-constructing shared perspectives and meaning by responding to question, CR).**

There is an implicit agreement and also an attempt to co-construct a new knowledge base as both of the participants (N and R) identified the necessity to negotiate the aspect of 'information storage' as the part of Information Security System. And in practice this posting can be categorised as the responding to the previous question posed by participant N. However as suggested earlier, in effective collaboration, the participants, must display to each other enough that everyone can judge where there are agreements and disagreements, conflicts or misunderstandings, confusions and insights. Therefore, it is necessary to observe whether this suggested answer is agreed or disagreed by the participant N and all others as without this explication, the attempt could remain just as a simple answer or a simple explanation where it is pretty difficult to gauge the change in the cognitive systems of the explainee. Although from the perspective of the collaborative learning, the change in the individual cognitive system is not the focus of the study, however until and unless the group members display their understanding of the meaning, it is quite difficult to affirm that meaning as shared.

Compared to the previous thread of discussion, this posting could be considered as a pure example of articulation of individual perspectives to the original question for Activity 2.

> **P:** I would say that Information Security Management has to do with the risk assessment of the information at hand (**Articulation of individual perspectives, IV**). The code of practise ISO/IEC 27002:2005 provides guidelines for the management of Information Security within an organization (**Sharing information resources, CIR).**

There is no such specific evidence of accommodating the perspectives of others, which has been going on in the previous threads. However the justification of the proposition made in this dialogue is supported by the example from a renowned source. In an implicit way this is also an attempt to co-construct a new knowledge in the practice situation as the authentic information from an authoritative source can be helpful for the group members to comprehend the issue from a definite point of view. For example, in the literature it has been proposed that material resources often must be brought to bear on the path towards mutual knowledge (Barron, 2000) and if there is any confusion in terms of internalising that subject matter from that specified source, it could be negotiated with others for the joint construction of meaning.

Exactly like the previous example, the tutor in this post has made an attempt to facilitate the discourse:

> **Tutor:** That's interesting: would you therefore say that security management and risk management are interchangeable terms? (**Facilitating discourse, setting climate for learning by further exploration of the concept).**

However at this point no dissonance or inconsistency has been identified in the participants' expression. Although, one emerging issue (the inter changeability of the terms 'Security Management and 'Risk Management') has come up, which can be added to the group meaning by interchanging the perceptions with one another.

By considering the attribute of this posting in the ongoing discussion, it is quite clear that it could be categorised as 'responding to question', as an attempt for co-constructing shared perspectives and meaning.

> **U:** Information Security Management basically deals with managing Confidentiality, Integrity, and Availability (CIA) of the information assets. On the other hand Risk Management is completely a different term in its own and hence it cannot be used interchangeably with Info Sec Management (**Accommodating the perspectives of others, direct disagreement, PD**).

In the posting by P, the idea was presented in such a way that one can presume that there is a scope of inter changeability between the two terms, 'Information Security Management' and 'Risk Management'. However, this posting clearly articulated disagreement of that proposition with a clear rationale as the justification. Especially in the situation like that, in the true collaborative practice, there should be the expectation to observe an explicit process of negotiation, which actually required participants to adjust their ways of thinking to accommodate new concepts or beliefs inconsistent with their pre-existing cognitive schema. However, if there is no explicit evidence of further negotiation, the co-construction process cannot be completed, and the knowledge element is difficult for incorporation into the group knowledge.

This posting, may be not directly related with the course of discussion happening in the previous sections, but it is also a great example of facilitating discourse:

> **Tutor:** The triplet CIA is often given in this order, probably because it sounds like the American CIA. However, is this important? Are the situations where you might drop one of the three? (**Facilitating discourse, setting climate for learning by further exploration of the concept**).

The focus has been paid to identify the significant element of knowledge associated with the core concept and has been brought forward for the further negotiation.

Considering the context of the discussion, this posting can be considered as the externalisation of the individual understanding of the subject matter.

> **D:** Confidentiality, integrity, and availability can be interrelated, and it is difficult to increase one without affecting the others.... While it has been common to order them as CIA, order is not significant--confidentiality, integrity, and availability can each be the most important component in varying scenarios **(Articulation of individual perspectives, IV).**

To some extent, this is the traditional technique to answer a question introduced by a tutor, this is the example of a two persons' dialogue, the tutor and the student.

From the theoretical perspectives, the discussion consists of arguments providing rationales for different points of view, as we see here:

> **A:** Ok, as I view them. Confidentiality means that.... **(Articulation of individual perspective, IV).** In ending, there was a previous post which said, you couldn't increase one without the other. This I disagree with, increasing the confidentiality of a document limits the number of people with access to it, not the availability of it **(Accommodating the perspectives of others, direct disagreement, PD).**

The interchange may gradually converge on a shared understanding resulting from a clarification of differences in interpretation and terminology. If the negotiation of the different perspectives does result in acceptance of a common result, then such result is accepted as knowledge. Therefore, once again in this situation there could be the expectation of iterative discussion which gradually might converge to achieve a definite outcome (in this case the specific answer of the topic itself).

Although this posting is a part of an ongoing thread, still there is no explicit evidence that the participant has considered the others perspectives, critically evaluated them, and proposed a further insight into the subject matter:

> **U:** Practically, I think there are rarely any chance where one of them (CIA) can be dropped expect. Hence, I believe it's a matter of requirements and essentially all three elements of CIA will be applied **(Articulating individual perspectives, IV).**

Instead, it looks as if this is direct communication with the tutor (as the question was posed by him), which can be expected in the conventional scenario of question-answer in the normal teaching learning situations.

The following post is a classic example, which could reflect that how the direction of the topic of discussion could move back and forth depending on the personal choice of the participant to pick up one specific issue especially when the learning environment is flooded with various individual topic of discussion.

> **P:** I tend to agree with U that the two terms (IS and ISM) cannot be used interchangeably (**Accommodating the perspectives of others, direct agreement, PA).** However I would say that they are somewhat related. Security Management focuses on the protection of information through prevention, detecting any security issues and acting accordingly. Once a risk is identified, then Risk Management comes into place. (**Co-constructing shared perspectives by proposing elaboration or extension, CE).**

This particular dialogue is fundamentally a part of that threaded discussion where the participants already discussed about the inter changeability issue of Information Security and Information Security Management. The categorisation of the message explicitly highlights the attributes of that message in the overall threaded discussion.

According to Stahl (2006), it is not always possible to resolve the problematic character of the personal understanding internally, particularly when it is provoked by other people. In that case the individual may need to enter into an explicitly social process and create new meanings collaboratively.

> **J:** In security management, there should be planning for Risk which in turn implies that Risk Management a part of Security Management. Do you think that is true? (**Co-constructing shared perspective, by asking for clarification/elaboration, CA).** About the definition of Information Security, all the replies above talks about Confidentiality, Integrity, and Availability. Unless it is considered a part of integrity, precision and accuracy is an essential in Information Security (**Co-constructing shared perspective, by proposing some alternative suggestions, CE).**

Here, the cognitive mechanism 'asking for clarification/ elaboration' supports the idea that in the social environment the restructuring of the pre-existing cognitive schema can only happen if the socio cognitive conflict is resolved by the mutual negotiation with others. Similarly, for the expansion of the knowledge base it is

important that the individuals should come up with the alternative suggestions as it could provide a great opportunity for the group members to analyse the internal meaning of the concept from multiple dimensions.

In the process of co-construction especially for the creation of the group meaning, it is important that the participating individuals should interact with each other by explicating their individual understanding of the subject matter.

> **U:** J, I believe precision and accuracy is usually considered as a part of integrity **(Co-constructing shared perspectives by responding to question, CR).**

Only in this mechanism, the group will aware of the similarities and differences among the ideas, which would be helpful for the development of group knowledge by clarification of meaning.

Now if we consider the next three consecutive posts, it is clear that this is fundamentally a three step IRF sequence (Sinclair and Coulthard, 1975; Mehan, 1979). Once again the tutor has identified new knowledge element in the threaded discussion:

> ***Tutor:** What exactly is meant by the term integrity? If that is defined correctly would it tell you where precision and accuracy are part of it? **(Facilitating discourse, setting climate for learning by further exploration of the concept).**

From the theoretical perspectives it could be categorised as an attempt to span the wide ranging views of the participants. The next posting may be considered as the simple response to the question, initiated by the tutor.

> ***U:** In information security, integrity means assuring accuracy and consistency of the information. The precision and accuracy terms are synonymous and can be used interchangeably **(Articulation of individual perspectives, IV).**

The next post is practically the feedback to the previous answer.

> ***Tutor:** Integrity can also be said to mean that there have been no unauthorised changes to the data **(Direct instruction by confirming understanding through explanatory feedback).**

In this IRF, or in this two persons' dialogue the teacher initiated (I) with a question, the student responded (R) and finally teacher provided feedback (F). Definitely, there is no dispute in terms of its use as an instrument for engaging students or for uncovering misconceptions; however CSCL locates learning in meaning negotiation carried out in the social world rather than in individual heads (Stahl, 2006). Therefore, it should be a multiple persons' dialogue where all the participants engage in the negotiation process for developing the response as a group not as an individual. As mentioned previously, from the practical point of view, it is not possible to represent the whole transcript. Here we can propose the summary description of the general nature of discussion by using the modified model of Murphy (2004).

Applying modified Murphy's model to Activity 2

The 44 messages in the overall threaded discussions are categorised according to the various phases of collaborative discussion defined in the modified model of Murphy.

Murphy (modified) categories	No. of messages
Social presence (S)	9
Articulating individual perspectives (I)	20
Accommodating or reflecting the perspectives of others (P)	8
Co-constructing shared perspectives and meaning (C)	14
Building shared goal and purposes (B) Organisational level discourse	0
Practice level discourse	0
Producing shared artefact (A)	1

Table 7.2: The number of messages with distinctive characteristics from the discussion in Activity 2

Since each message might contain several indicators, the total in Table 7.2 adds up to more than 44 (the total number of messages in the threaded discussion).

The categorisation of the messages in terms of their individual characteristic as well as contribution towards collaboration reflects the mechanism of knowledge construction that I have presented through the examples of messages in the previous sections. Apparently from this categorisation, there is the existence of a shared artefact in the practice situation, however there is no evidence of any organisational or practice level discussion under the category of 'building shared goal and purposes'. However, I think at this point it is worth focusing on the process through which the shared artefact has evolved.

In this Activity two special postings deserve specific attention as they play a significant role in identifying the learning situation as collaborative. Referring back to the proposition by Schrage (1995), collaboration is supposed to produce something, which should be measured by its result. In the simplest cases this production could be a summary or distillation. Although in terms of Murphy's model (2004), in effective collaboration the individuals should suggest a possible activity on which participants might work together, still the idea of building shared goals and purposes can be introduced by the tutor. From this perspective the following posting by the tutor can be categorised as a conscious attempt to produce the ultimate outcome of the collaborative discussion.

> **Tutor:** Would anyone like to start to summarise the key points in the discussion thread?
>
> **Participant S:** As earlier mentioned in the discussion, Information Security Management is identification of all the threats that can affect the system behaviour and then making an informed decision and subjective judgement with the aim of protecting the CIA of the information system. Information Security is protecting or safe-guarding of information assets, that is, the CIA of the information asset.

In relation to the previous proposition, this posting is the representation of the artefact, which is supposed to symbolise the shared group results that they have negotiated. However this is basically another example of articulation of individual perspective, although an implicit accommodation has been done, by mere

consideration of the commonality among the judgements, proposed by participating group members.

In practice, it seems a reasonable approach by the tutor, but only really works, if others engage in a dialogue about it. If no-one responds then the tutor might try to invite them to do so. However in this circumstance, no attempt has been made by the other participants for further negotiation of the proposition to refine it as a group product; similarly the tutor has not invited them to engage. This situation is depicted by the numerical representation of the nature of discussion presented in the Table 7.2 (where there is no evidence of any practice level discussion or the subsequent number of different versions of the artefact).

Here, rather than making any general comment about the nature of the discussion of the entire Case Study one, I will first analyse the other sets of threaded discussion around Activity 5.

7.42 Activity 5: Is there such a thing as good hacking? Analysis of messages

As mentioned earlier, it is impossible to represent all of the 53 messages in this section. Consequently, the messages are selected mainly to represent the cognitive dimensions of collaborative interactions. However, the messages are presented in sequential order.

Articulation of the individual perspective is typified by this initial posting:

> **Re:** To my mind NO! Hacking is HACKING. By saying good, ethical or anything else in front of hacking leaves it open to many interpretations I believe. Call it penetration testing ....the success of it. The owner is aware of what is going on. There is nothing clandestine as in hacking **(Articulation of individual perspective, IV).**

Exactly like the previous examples of Activity 2, this posting is also the initiation of the individual participant to externalise the tacit understanding through words, necessary for starting a group discussion.

In the next example the tutor adopted a similar strategy for the facilitation of discourse:

> **Tutor:** I like the separation between hacking and pen testing but apart from the permission of the system owner is there any difference in the hacking techniques used? (**Facilitating discourse, setting climate for learning by further exploration of the concept**).

This is a careful analysis of the individual posting, identifying the different knowledge elements associated with the principal theme and presenting it before the participants for further consideration.

This posting could also be considered as the articulation of individual perspective

> **Re:** With regard to your question about the difference in hacking techniques between an authorised user and a Pen Tester. Ed Skourdis a professional colleague...........once told a story about how there are regulations set on testers by clients...................They are also not allowed to utilise certain "tools" that a 'hacker" will use and exploit (**Articulation of individual perspective, IV**).

There is no obvious evidence of referring to the previous posting of participant R. In true sense, it is basically the response to the question, initiated by the tutor.

As I proposed earlier in the first example of Activity 2, it is always better to interpret some abstract concept against the context where it should be used.

> **T:** This is a difficult question to answer when you consider the global security issue today (terrorism) and the measures that many governments are taking to combat it. (**Articulation of individual perspective, I**) Is it right for governments to hack into the computers of suspected terrorists to gather intelligence information? At the same time should people who pose public security risk be allowed to keep their privacy? In my opinion there could be such thing as 'good hacking' as long as this is done in the public interest. The danger is when and how to draw the line between what is in the public interest and what is not in the public interest (**Co-constructing shared perspectives, provoking thought and discussion, CP**).

The contextual variations might have a significant impact on the abstract definition; therefore it is always better to specify the contextual variations before going for any generalisation of the concept. And this significant issue has been highlighted in this particular message, which could provide the impetus for others

not only to think about the concept from a critical point of view, but also to discuss the alternative definitions for the deeper understanding of the meaning.

The clarification of the meaning is one of the primary mechanisms involved in the collaborative knowledge building. For example,

> **Re:** You used the word ' suspected' terrorists. Who decides? What if it was decided that you are or I am a suspected terrorist? **(Co-constructing shared perspectives and meaning, asking for clarification, CA).**

From the analysis perspective it is important to take into consideration how far this issue would be successfully resolved by the mutual negotiation among participants.

Exactly like the other socio-cultural learning, even in case of collaborative discussions, there is every possibility that the discussions could be expanded in breadth where newly added knowledge might be helpful for the expansion of the core conceptual structure (which is primarily based on the common interpretation of the issues by the participants) and could be resulted in productive learning. Gunawardena et al., has described this type of learning as 'learning by accretion' or 'pooling of knowledge', as in this type of learning, participants are active in each other's learning processes only by providing additional examples of concepts, which in essence are already understood. However, in this context it is important to consider how the participants have perceived other's interpretations of the phenomenon, and how they have worked on them to improve their current understanding. For example,

> **Ra:** The term hacker today co notates someone who aims to breach a system and wreak havoc, which in reality is incorrect. The original term "hacker" referred to ....To categorise all "hackers" as bad is an incorrect assumption, as there are those individuals who genuinely like to fix systems and hold no ill or criminal intentions toward any one system. According to the MIT a "code of ethics".... **(Articulation of individual perspectives, IV).**

From the pure theoretical point of view, it is the simple articulation of individual perspectives, but considering the situation of the threaded discussion, it could be said that this is the elaboration of the concept by adding additional examples, which might be useful for the extension of the existing knowledge base of the

group as a whole (although, this elaboration cannot be related as the possible answer of the previous question). For the success of collaborative interactions it is essentially important to monitor the further negotiation of the newly added knowledge, otherwise it could remain unacknowledged without ever being confronted or supported by others.

The next posting is different:

> **A:** Thank you Ra for the detailed description about the term hacking. I was not aware of that. Thanks again. Actions, irrelevant of their nature ....May be, for all that we know, they wanted the system to be vulnerable. Doing the same thing with the permission of the responsible persons is not hacking, but testing (**Articulation of individual perspectives, IV).**

Categorically, this is the articulation of an individual perspective, but this posting also highlights the consideration of the context before generalising the definition of the concept. Therefore it is quite resonance with the previous post sent by participant, T. As a result an essence of an implicit agreement is associated with this posting.

This is another example of an attempt to co-construct the shared perspective:

> **Re:** A, it is very thought provoking but where do we draw the line? Who will guard the guards? (**Co-constructing shared perspectives and meaning, asking for clarification, CA).**

It is done by asking for clarification of the meaning. However as said earlier, the process of co-construction cannot be completed if there is no mutual negotiation to establish the common meaning.

The conversation continues:

> **M:** Unfortunately hacking, good or bad, is universal. It is virtually impossible to maintain ethics or jurisdiction. It is better not to have it rather than having it without control (**Articulation of individual perspective, IV**).

As proposed earlier, in the overall discussion there could be several threaded discussion evolving around specific area of thought. This post is quite different

from the previous nature of the discussion, however here the central focus is on the ethical dimension of the hacking, another significant component of the principle idea, which should be negotiated from the multiple points of view.

The following post signifies the role of the tutor in the discussion forum;

> **Tutor:** As you construct your arguments: can you identify the management, social and technical dimensions which determine whether hacking is viewed as good or bad and how these dimensions might influence each other? **(Direct instruction, present question).**

As proposed by Laurillard (2002), to build an increasingly rich understanding, it is not enough to know the tool but it is essential to comprehend how it operates. Exactly in this context, before differentiating the idea of good and bad hacking from an abstract point of view, it is important to consider all these relevant dimensions or contextual factors which significantly determines the use of the term as good or bad.

> **Ro:** Whether something is good is an ethical decision, so I would say that there is no immediate management or technical dimension here. Our ethics are shaped ....to the Internet has changed society in some way or another. I'm not sure how management fits in, if it does at all. **(Articulation of individual perspectives, IV).**

Exactly like the previous example, this is a response to a question, initiated by the tutor. As it is very much restricted between the tutor and the participant, therefore it could be categorised as the simple articulation of individual understanding.

> **Tutor:** Could it be that the management components (policies, processes etc.) tune the organisation's responses to the ethical climate in which it operates i.e. balances the business' needs and objectives with the ethics of the employees, customers, service providers etc.? Any thoughts? **(Direct instruction, present content/question).**

In reality, to focus the discussion on specific issues, it is important for the tutors to present a new content in the discussion forum. However, in the collaborative situation the tutor might be expected to be acting as a co-learner, as opposed to being the authority of knowledge. Therefore rather than simply suggesting the

information as an authority of knowledge, his feedback should incorporate the aspect of further negotiation from multiple points of view.

In the next posting, as there is no reference of the previous dialogues, it might be categorised as the articulation of the individual perspectives:

> **Robert:** If we could agree on a definition of hacking then it would be easier to answer the question. So to consider a few of the possible scenarios: Accessing systems without permission and/or causing damage for fun or profit is definitely not good. ....Accessing a foreign government system because you think they are hiding UFOs is not, just criminally stupid. **(Articulation of individual perspectives, IV).**

However if we read the message with a mental ear ready, then it would be quite obvious that this is the actual co-constructed knowledge as the overall concept presented in this message is very much discussed by the several participants.

The next posting is similar:

> **Re:** It's sort of difficult to write a simple definition of something as varied as hacking. I have begun to realise once you acknowledge that it is more than the modern day meaning and the one put forward by the media. **(Constructing through reflecting on the views of others, CCR).**

In terms of the internal characteristic of the message, this one is very similar to the previous one. Although the post looks like the articulation of an individual perspective, still it is the evidence of the co-constructed knowledge of the individual as his current understanding is very much influenced by the group discussion (evident from the part ' I have begun to realise.....').

At this point once again, it is important to represent the general characteristic of the threaded discussions as it is not practicable to offer all the messages presented in the overall thread.

Applying modified Murphy's model to Activity 5

As previously stated as usual in this circumstance also, initially the messages are identified using the specific indicators of the Murphy's model and gradually categorised them according to the six major processes of collaborative learning defined by the same model.

Murphy (modified) category	No. of messages
Social presence (S)	7
Articulating individual perspectives (I)	21
Accommodating or reflecting the perspectives of others (P)	8
Co-constructing shared perspectives and meaning (C)	18
Building shared goal and purposes (B) Organisational level discourse Practice level discourse	0 0
Producing shared artefact	1

Table 7.3: The number of messages with distinctive characteristic from the discussion in Activity 5

Since each message might contain several indicators, the total in Table 7.3, adds up to more than 53 (the total number of messages in the threaded discussion).

From the summary description of the nature of the discussion, it appears that the nature of the discussion is very much confined within the individual epistemology rather including the aspect of overall group cognition. However, this demonstration points towards the existence of a shared artefact without any obvious interaction in either organisational or the practice level. As the objective of this research is to unpack the evolution of the shared artefact before labelling the learning situation as a collaborative one, a purposeful approach has been taken to depict the mechanisms through the presentation of another set of messages.

As in the previous example in Activity 2, the following posting could be considered as an initiation by the tutor to produce something as evidence of

collaborative effort, and the justification I proposed in the earlier case is equally applicable in this situation.

> **Tutor:** This discussion is getting quite long, so perhaps we can make it a bit more manageable by summarising where we are now. Would anyone like to start to summarise the key points in the discussion thread "Is there such a thing as good hacking?"

As a consequence, once again the following posting can be the representative example of the shared artefact.

> **Participant N:** My attempt to make the summary. Is there such a thing as good hacking? There was a mixture of "yes" and "no"; "advantages" vs. "disadvantages"; "ethical" vs. "unethical". There were several views that I found interesting that defined the debate. I feel that in general there was agreement on "what the action is", and that the "good" or "bad" depends on where the action is applied. The centre of controversy I found is that the word hacker/hacking is more associated with the bad action than to define good. I will try to point out a few things I personally found of benefit:
>
> Hacking is hacking; PEN Testing is PEN Testing
>
> For good hacking one should follow a strict defined "code of ethics"
>
> A hacker with criminal intensions is a "cracker"
>
> Actions are considered good as long as they produce positive results – the same applies to hacking (e.g. to identify weaknesses in a system)....................

In this episode as well, the participant's posting can be classified as the interpretation of the concept from the individual point of view. Although some of the elements which he has cited have emerged through the discussion in the group level, it could be judged as the presentation of the accumulated facts, rather than the confirmation of jointly constructed knowledge (the acute absence of messages in the organisational and practice levels of discussion presented in Table 7.3 reconfirmed the interpretation). In the threaded discussion around Activity 5, there were numerous occurrences, where the knowledge elements evolving around the zone of mutual disagreement have not been resolved by mutual negotiation, and

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therefore the resolution process relied completely on the individual's own initiative to resolve the conflict. The knowledge that appears in those situations is more likely to be an individual construction than a construction through negotiation. However from the theoretical point of view, the group meaning is not just some kind of statistical average of individual mental meanings, an agreement among pre-existing opinions, or an overlap of internal representations. A group meaning is constructed by the interactions of the group's individual members, not by the individuals on their own (Stahl, 2005).

7.5 A critique of the outcome of the analysis of the threaded discussions in Case Study one

According to the literature, the notion of collaborative knowledge building is much more tangible than other possible approaches of socio-cultural learning and it cannot simply be applied everywhere but refers to specific, identifiable occurrences (Stahl, 2006). Therefore before labelling any practice situation as a collaborative one, there is a need to analyse the learning environment in such a way that there should be evidence of knowledge construction by the group as a whole rather than reified facts being recycled.

At this point it is necessary to summarise what my analysis revealed about the interactions and the nature of collaborative learning of Case Study one. From the Tables 7.2 and 7.3, it is quite clear that majority of the messages are in the category of 'articulation of individual perspectives'. It is quite true that a considerable number of messages are in the category of 'co-constructing shared perspectives/meaning'; however the critical evaluation of these messages demonstrates the fact that most of them represent the initiation of co-constructing something (like asking for clarification/soliciting feedback) as opposed to the concrete evidence of 'constructing through reflecting on the views of others.

Consequently, the critical analysis of the above dialogues never represented knowledge construction as an effort by the group as a whole, whereas it is a typical example of a discussion forum which is flooded with the various themes of the core concepts. From the practical viewpoint, this sort of diversion in the discussion topics is quite desirable in any socio cultural learning environment as this is the only means to critically evaluate the central concept from its multiple

dimensions, along with the clarification of certain terms which might otherwise create confusion for participants. However, considering the specific attributes of collaborative learning, the evolution of certain ideas is not the sole objective of the interaction; what is required is the mutual negotiation among the participants that could bring a significant change in the understanding of the group as a whole.

For example, there was evidence of the development of conflict among the participants, although the resolution process was not observed. From the perspective of individual epistemologies, the resolution of cognitive conflict could take place in the individual heads; in that case there is no need to focus on how cognitive conflict has actually been resolved by the negotiation with others. In an individual epistemology, collaboration provides the conditions and support for learning, so that the only requirement on the others is to provide feedback as this social-as-context view might maintain that learning remains fundamentally a process within individual minds (Suthers, 2005).

On the other hand, in the case of collaborative interactions, the focus is not on what might be taking place in the heads of individual learners or how the individual learners resolve the issues of cognitive conflict by themselves, but on what is taking place between and among them in their interaction, or how the individual participants resolve the conflict through the process of extensive negotiation with others. In line with that, from the 'dialectical' perspective, the critical discourse should be composed of a thesis–antithesis-synthesis structure, where one student proposes his/her analysis of a course reading, a second student offers a counter-proposal, and through reasoned, reflective discussion, they come to a more sophisticated, higher-level synthesis (Rourke and Kanuka, 2007). However, the above dialogues are quite restricted, going up to the second stage of 'thesis-antithesis' but showing no such evidence of the phase 'synthesis'.

It is true that, collaboration is not simply a 'treatment' which has positive effects on participants (Dillenbourg, 1996). However, at the same time if the learning environment is termed or labelled as collaborative, then a proper concern is with whether students actually ever do their studying in this specific social manner (Crook, 2000). From this perspective, Case Study one is difficult to label as collaborative.

The discussions around these two activities have only elaborated in terms of breadth, but did not go deeper and did not arrive at integration or a conclusion. The connections among different messages helped the discussions only in terms of further expansion, where often newly added knowledge remained unacknowledged, without being further refined, elaborated and without ever being confronted.

The underlying pedagogical approach of both of the activities (Activity 2 and 5) prioritizes the value of discussion with peers as an aspect of learning. And we can say that the reciprocal dialogic process of question-answer, thesis-antithesis or point-counter point could be a productive part of this type of learning. However rather than focusing on the shared conception or joint understanding of the meaning, the essential emphasis was on the individual epistemology. As a result the learning in groups has been treated as a matter of an individual learning process, where the social interaction has been counted as one of the contextual variables on individual cognition. Therefore, from a theoretical point of view, this learning environment can be labelled as socio cultural learning.

We have already considered that in the course of collaborative interactions the students should be directed to respond and participate in a manner from which they derive optimum benefits. In the examples of the threaded discussions for both of the activities, a significant presence of the tutor was detected which is very often categorised as facilitating the discourse. However while analysing the subsequent effect of that facilitation towards a collaborative outcome, it was concluded that the initiative was more restricted to the peripheral exploration of the different knowledge elements than to guiding the discussions towards achieving the productive outcome through extensive negotiation. In fact this characteristic of involvement is much more appropriate in case of socio cultural learning, where the individual epistemology of constructivism is the focus of study; however this approach is not adequate to achieve the group meaning through the process of shared knowledge construction.

As I proposed earlier, the task design is not quite sufficient to achieve the goals of learning through collaboration. However, the general characteristic of this kind of task design and the underlying pedagogy of the practice environment cannot be fully appreciated until and unless we study the relationship between the individual

tutor's perception of those issues and their practical approach to instantiating that perception in their day-to-day activities.

Here, it is important to represent the tutor's perception about the various aspects of collaborative learning.

7.6 Analysis of the interview data

In this analysis, I will represent the essential information which I acquired in the course of the semi structured interview with the tutor. These questions are unambiguously associated with the methodology of facilitating the group discourse to attain the purported outcome of collaborative discussions. In fact, the analysis of the interview data is grounded on the hypothesis that investigated teachers' beliefs about computer-based instruction may have had an influence on their classroom behaviour (Webb & Cox, 2004).

1. According to your perception what is collaborative learning?

    Response: Collaborative learning is where people work together to build a greater knowledge base than they would do individually, stimulated by peer questioning and response....the collaborative approach is really important because that helps the students to learn jointly, rather than depending completely on their teacher. It can also provide a wide opportunity for the tutors to experiment on, how the students are moving, how they are learning which is quite difficult in the traditional lecture approach.

    This response quite significantly echoed the definition of socio cultural learning, which recognises the value of having to articulate an idea, and to negotiate, in the continual iteration of discussion. However, if collaborative learning were to be interpreted as the amalgamation of constructionism with social learning, this has not been encapsulated in this particular tutor's insight.

2. Do you expect any distinctive learning outcome from the collaborative approach?

    Response: Not distinct as such, only better than an individual learning experience.

As this response would be assuredly influenced by the individual interpretation of collaborative learning, consequently the expectations in terms of the learning outcome would be aligned with the approach taken in the practice situation. For example, if collaborative learning has been considered as similar to socio cultural learning or mere discussion based learning, then the tutor's expectation should be restricted to the individual construction of knowledge within social setting as opposed to the group achievement through the discourse.

3. What are the conditions (or factors) you have to take into your consideration to make collaborative learning successful?

> **Response:** Good activities, excellent facilitation, probing questions, a purpose to the collaborative learning.

The dominant concern of this thesis is that if the intention of the collaborative learning is focused on the individual epistemology, then the corresponding activities and the technique of facilitation cannot reach to achieve the true effect of collaboration. As analysed earlier, the task design can be attributed to the social discussion, where the participants' diverse perceptions can provide the momentum for others to alter the existing view. However the task design/activities did not focus on specifically how to achieve and how to guide the participants to achieve something collaboratively. Similarly the facilitation has not been directed towards the production of a shared artefact, which is helpful for developing the shared understanding. In a nutshell, the conceptualization of the term collaborative learning could be the prime condition to make this tutor's approach more successful.

4. In terms of your perspective what would be the tutor's role in the effective collaborative discussion?

> **Response:** The first and foremost role of the tutor would be to bring people for the collaborative discussion and provide activities which are interesting and helpful to keep the discussion going on. I think at the moment, rather than merely transmitting the knowledge, the role should be focused as a facilitator.

It is a reality that collaboration is not simply a treatment which always has positive effects on participants (Dillenbourg, 1996). The irrefutable consequence of interaction for social construction of knowledge cannot be effortlessly achieved by just bringing people in the conference and providing interesting activities to keep the discussion going on. If that is the fundamental underlying pedagogical assumption of using discussion for knowledge construction, then the learning environment should be aimed at information processing with a hope that some of the information will be lifted by the individual to extend their knowledge base through self initiation/motivation. In that context the knowledge creation in the discussion environment will not be significantly different from the mechanism involved in individual knowledge development process using the resources through internet or the resources available in libraries. This process cannot result in co-construction of knowledge as there is no scope to include the phase of mutual negotiation in the process of knowledge construction.

5. How can you ensure the maximum participation in the collaborative discussion?

> **Response:** We make participation compulsory as the attendance requirement – otherwise we could not know whether students were really engaged or not (can't tell from their body language as you could in a class).

The collaborative participation cannot be aligned with the attendance requirement. The attendance requirement is somehow closely related to the forced participation which might result in the poor quality of the collaborative product. The process of active participation needs constant motivation to engage the participants in the higher order thinking process. The participation through sharing of information can satisfy the attendance requirement but it cannot direct the discussion for the co-construction of knowledge.

7.7   Conclusion

In this Chapter, the micro-analysis of the threaded discussions, the critical evaluation of task design, the facilitation approaches, and the perception of the tutor about collaboration, together suggest the interrelationship among the various factors or conditions of collaboration which can guide the process of interactions

towards its effectual outcome. The following Table summarises the findings to highlight the impact of different factors on collaboration.

Factors	Case Study one
Tutor's perception of collaboration	Limits collaboration to discussion
Nature of task design	Not explicit about collaboration
Tutor's role	Provides information about the subject matter
Low level messages	73
High level messages	34

Table 7.4: Summary of the findings of Case Study one

This summary format provides a generic way of representing the findings of each of the case studies and will be used also in the following chapters.

As noted earlier, since each message might contain several indicators, the total in Table 7.4 adds up to more than 97 (the total number of messages in the threaded discussions of Activity 2 and 5).

The number of low level messages is the sum of all the messages, across all the activities in Case Study one, that are categorised as: 'social presence' (S) + 'articulation of individual perspectives' (I) + 'accommodating or reflecting the perspectives of others' (P).

The number of high level messages is the sum of all the messages, across all the activities in Case Study one, categorised as 'co-constructing shared perspectives and meaning' (C) + 'building shared goal and purposes' (B) + 'producing shared artefact' (A).

From this tabular representation (Table 7.4), it is quite clear that,

- Although, in theory, researchers have made a distinction between socio-cultural learning and collaborative learning, the acceptance of this theoretical view is still not effectively realised by the practitioners, which is reflected through the analysis of the interview data.

The characteristic of the task design as well as the nature of the discourse was very much guided by the interpretation of the term 'collaboration' by the tutor. For example,

- The task design did not provide sufficient guidance (in terms of structure, composition of the group, nature of interactions), which was necessary to obtain the desired outcome of collaborative interactions. In the name of collaboration, the tutor provided a mutual interactional space where the participants can discuss a chosen topic in order to expand their individual knowledge base principally by the effect of self initiation (the sufficient requirement for mere discussion based learning).

- The categorisation of messages presented in the Tables 7.2 and 7.3, clearly demonstrates the fact that the focus of discussion was restricted to the lower cognitive activities, like 'articulation of individual perspectives', where no significant initiative was taken by the participants for the further negotiation of the meaning. Task design as well as the nature of facilitation was responsible to a significant extent.

- As the idea of 'group cognition' is not successfully comprehended by the tutor, the facilitation approach was very much confined within the peripheral exploration of the subject matter. The mere introduction of the topic got more priority as opposed to the extensive negotiation of the topic for the development of shared understanding of the meaning.

In conclusion, the discussion area around Activities 2 and 5 represent the kind of interactional space where individual contributions can be deposited, and then the active participants can take advantage of the accumulated information, and then process this individually, rather than mutually negotiate to establish a common understanding for the group.

Chapter eight: Case Study two

8.1 Case Study two

This Chapter will represent the Case Study two, which will include the presentation of the threaded discussions along with their subsequent interpretations. The effort focuses on identifying the existence of collaborative learning mechanisms in the practice situations. As conditional effects of collaborative learning, the task designs and the perceptions of the tutor are scrutinized critically as they have an immediate impact on the success of collaborative interactions.

8.2 Brief introduction of the Case: Development Education

This is the module from a course for MA in Development Education. The objective of the course is to develop the overview on the topics like 'Principles and Practices of Development Education' and 'Development Education in the Era of Globalisation'. Here the module is offered as a distance learning course using the technical infrastructure of Blackboard (Bb).

Activities	No of participants	Duration	No of tutor	No of messages in the overall thread
Activity 2, group 1	2	1-16 Feb 2008	1	10
Activity 2, group 2	4	1-16 Feb 2008	1	23
Activity 3, group 2	4	18th February - 2nd March, 2008	1	20
Activity 3, group 4	4	18th February - 2nd March, 2008	1	66
Activity 6, group 1	3	30thMay- 13thJune, 2008	1	10
Activity 6, group 2	3	30th May - 13th June, 2008	1	9

Table 8.1: The general overview of the course

The data and analysis of this case is described in the following sections.

8.3 Task design

In this context it is important to reflect on the general trend of task designs for the three different activities under study:

Activity 2

First part: Individually you have to review the definitions of development education provided in the resources associated with this activity. Post your thought in the Activity 2 discussion space for your group.

Second part: The second part of the task is to be carried out as a group and the goal is to write an agreed report that includes: 1) A review of the definitions of

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development education provided in the resources associated with this activity. 2) A description of the common elements present in all the definitions of development education that your group analysed. 3) A discussion of the 'agendas' behind each of the definitions that help to explain some or all of their differences and similarities.

Activity 3

First part: Individually create a diagram of 'education for sustainable development'. Please add a rationale which explains why you have made particular connections/ relations between the concepts. Send this document in the small group discussion space. Have a look at the files sent by the other members of your group and see if you can identify similarities and differences between their diagrams and yours.

Second part: As a group, create a common agreed diagram of the concepts you have just worked on individually with an explanation/ rationale. Also be sure to include a 500 word explanation/rationale so that other members of the course (both students and tutors) will be able to understand it.

Activity 6

First part: Individually, read the definitions of 'global citizen' provided in the readings and resources associated with this activity. As you read, think about the following questions:

(i) What is the agenda behind each of these definitions?

(ii) Is the definition indicating that people are global citizens just by the fact they live in planet Earth or do people become global citizens according to certain criteria? If the latter, how?

(iii) Are the definitions implying that being a global citizen is related with your way of thinking, way of living, things to be doing, ideas you support? Or with all of them? What are the rights and responsibilities of a global citizen?

Post your thoughts about the resources and these questions in the Activity 6 discussion space for your group.

Second part: As a group, discuss your individual postings and write an agreed report (500 words) which addresses the following questions:

What are the main features of a 'global citizen'? What are the relationships between the idea of a 'global citizen' and the TOE methodology and learning theories we discussed earlier in the module? Are there any benefits (or problems) in using the term 'global citizen'? If so, what are they?

Submit the group report to the main Activity 6 'Who or What is a Global Citizen' discussion space.

The following sections analyse the messages relating to these two activities, and the outcomes they achieved.

8.31 The analysis of task design

In general, all these three activities are divided into two different parts.

- The design of the first part of the activity attributes to construct a learning environment around the initial understanding of the participating individuals. The objective might be to refine the initial understanding of the concept, or to facilitate the process of transition from putative conclusion to inferences. Or in other words, the objective could be to build up a sound theoretical knowledge by negotiating the idea presented through the initial contributions.

As suggested earlier, if the entire process of collaborative interaction can only be completed by the creation of shared artefact, then it is important to consider what specific measures has to be taken in terms of instructional support for the participants to formalize or objectify the collaborative knowledge into shared artefact. Now in this case, all the three activities have a separate component which requires the production of an agreed group report through mutual discussion mainly to demonstrate the group understanding as a whole.

Therefore, it is quite logical to say that,

- The overall task design is reasonably aligned with the theoretical proposition of collaborative interaction.

However at the same time it should be kept in mind, that, the task design did not provide enough guidance in terms of

- How to collaborate, which means there is no such specification has been provided to structure the collaborative process in order to favour the emergence of productive interactions.

Alternatively, we can say,

- There is no such guidance has been incorporated into the structure to regulate the interaction.

However, it might be that the regulation of interaction can be done by the tutors just as well during the actual progress of the collaboration. In practice, these two processes (structuring the process and regulating the interaction by intervention) are complementary to each other. Moreover, it can be said that when teachers engage students in collaborative learning, they usually provide them with global instructions such a 'do this task in a group of 3'. These instructions usually come with implicit expectations with respect to the way students should work together (Dillenbourg, 2002). Therefore, to some extent the success of collaborative interaction is also dependent on the interpretations of the task as well as the associated instructions in terms of how students understand what is expected of them.

- From this perspective, here the instructional approach might be helpful for the participants to conceptualise the requirement of task through reflecting on their previous experience of collaboration or the internal script.

Another interesting observation has been made in the task design. For each and every activity, the tutor has proposed one individual as the coordinator of the group to complete the activities effectively in a co-ordinated way.

However, interestingly, in the studies by Hara et al., (2000), Tagg (1994), and Veen, Lam, and Taconis (1998), Leh (2002), Poole (2000), Cifuentes and Murphy (1997), the role of the students has been termed as 'moderator' as opposed to 'co-ordinator'. The role of the 'co-ordinator' might be different from what we can expect from a 'student moderator' whose responsibility is to facilitate the discussion exactly like a tutor in the learning space. Here the role of the co-ordinator could be restricted especially in the meta-communicative phase, i.e. only within the boundary of organisational phase of the communication. However from the research point of view, it is significantly important to analyse this specific role, mainly for the effectiveness of the collaborative discussion.

8.4 Analysis of the data from the threaded discussion

As before, the posts in the sessions are analysed in terms of modified Murphy's model, for each activity, by group. Here, each message as a unit of analysis has been identified (the specific indicators under all major categories has used for identification, the detailed description has been provided in Chapter five), and categorised according to the six different phases of the collaborative process.

Like all other previous cases, authors of postings are identified by initials only. Similarly, specific indicators have been used to express the characteristic of the messages, for example as proposed in Chapter five; the symbolic representation of IV represents the categorisation as 'articulating individual perspectives'; PA, 'accommodating the perspectives of others'; CA, 'co-constructing shared perspectives' etc). In each case the quote is categorised and then interpreted for its pedagogical significance in relation to the theory.

Typically, the tutor's role should be measured using a model proposed by Anderson et al., 2001, by categorising the messages posted by the tutor into three major categories: 'Design and organisation'; 'Facilitating discourse' and 'Direct instruction'. The detailed description of this model has been presented in Chapter five.

As mentioned earlier, the messages are selected mainly to represent the cognitive dimensions of collaborative interactions. However as usual they will be represented in sequential manner.

8.41 Activity 2, group 1: Analysis of messages

The initial posting is a typical representation of the articulation of the individual perspective in the collaborative situation.

> **Participant N:** Please find attached my attempt at bringing my ideas together around the 3 questions for this activity **(Articulating individual views by submitting the initial posting, IV)**.

This is the individual's attempt to express their initial understanding of the subject matter.

The next post could be considered as a mixture of different activities:

Participant C: I have attached some notes on the first section on the definition of dev. ed. **(Articulating individual views by submitting the initial posting, IV)**. N, I think your table does well to describe the common elements **(Accommodating the views of others, direct agreement, PA)**. Although I wasn't sure what the asterix was in Doug Bourn's section was. Can you explain? **(Co-constructing shared perspectives by asking for clarification, CA)**. Perhaps the only comment I would add would be on the destabilizing effect that Dev Ed can have on charities which may result in Questioning of their objectivity by critics. **(Co-constructing shared perspectives by proposing elaboration, CE)**.

It ranges from articulation of individual perspectives, accommodating the perspectives of others and the attempt to co-construct the shared perspectives and meaning by engaging the cognitive activities like asking for clarification and proposing elaboration.

This post is quite interesting in terms of its character.

Participant N: The processes point you highlight was what I was identifying * in Bourn; the idea that DE is as much learning the means ....and empowering as the subject itself **(Co-constructing shared perspectives, by responding to question, CR)**. I think that your point about that the audience of DE is everyone is more complex. I agree that it should be everyone **(Accommodating the views of others, direct agreement, PA)** but the perhaps different levels of DE needs to pitched at different audiences........ **(Co-constructing shared perspectives by proposing elaboration, CE)**. In terms of tying this up, of course I'd like to hear your comments **(Proposing a shared goal, BP)** but think perhaps it is worth moving onto the next activity without doing a summary between us, or we'll be both be playing catch up **(Organizational level discussion, BW)**.

Considering the discussion between the two participants (C and N), much effort has been taken in this post to respond to the question posed by another, along with the rationale which can provide the significant justification for the particular nature of understanding of the individual. However at the same time, it does also

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expose that the attainment of group understanding could be inhibited by the way the course has been designed as a whole. The participant has acknowledged the implication of mutual negotiation to ascertain the concept as an agreed one, but the circumstantial pressure primarily the demands of the other activities of the course, has forced them towards the surface approach of learning.

This posting could be considered as the obvious reaction of the situation:

> **Participant C:** I am happy to go onto the next activity as time is short. Do you want to post your contribution as the agreed one? **(Organisational level discussion, BW).**

The participant is only concerned about the representation of something as a group product but very much ignoring the aspect of quality of work.

The next one is quite significant in order to represent how the objective of the collaborative discussion defined at the starting of the course could be altered radically before obtaining the purported outcome.

> **Tutor:** Sorry that you've been left on your own on this one, but many thanks for working so hard on it! If you are happy to edit and post N's original contribution, I think that would be fine. At least this way, you can make share the interesting thoughts you've been discussing with the other groups, and also move on with Activity 3.

The task design explicitly necessitated the creation of an agreed group report. Furthermore, it has to be kept in mind that this learning environment has been labelled as a collaborative one by the tutor and even the posting of the participants quite clearly expressed that they have understood the demand of the Activity as well as the possible approach of negotiation to accomplish the job. However at this point, the tutor herself contradicting the objective of collaborative discussion, mainly by overlooking the fact that a group meaning can only be constructed by the interactions of the group's individual members, not by the individuals on their own.

The next two postings symbolise the fact that the mere existence of any artefact is not enough to categorise the learning environment as a collaborative one.

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Participant N: I feel our discussion, could be refined. I might add a note that people can read our discussions within our area-rather than post it as group contribution - what do you think? **(Organisational level discussion, BW).**

Participant C: Good suggestion **(Organisational level discussion, BW).**

Now at this point it is necessary to illuminate the general nature of the discussion throughout this Activity. The modified Murphy's model can be used to categorise the messages in terms of their specific attributes, as illustrated for the first 7 messages above.

Applying modified Murphy's model to Activity 2, group 1

Murphy (modified) category	No. of messages
Social presence (S)	7
Articulating individual perspectives (I)	2
Accommodating or reflecting the perspectives of others (P)	3
Co-constructing shared perspectives and meaning (C)	5
Building shared goal and purposes (B) Organisational level discourse Practice level discourse	3 0
Producing shared artefact (A)	1

Table 8.2: The number of messages with distinctive characteristic from the discussion in Activity 2, group 1.

Since each message might contain several indicators, the total in Table 8.2 adds up to more than 10 (the total number of messages in the threaded discussion).

This presentation clearly shows that no significant discussion has taken place in the second part of the Activity especially during the production of the agreed group report. The desired practice level discussion concerning the cognitive engagement among participants to produce the shared artefact is missing in this instance. Consequently, at the end of this discussion thread it can be concluded that for the effective creation of a shared artefact, what is essential is for the tutor to monitor the process through which it has evolved.

8.42 Activity 2, group 2: Analysis of messages

The first posting can be categorised as the initial proposition/strategic planning by the co-ordinator to accomplish the collaborative task.

> **Participant O**: I have been appointed as co-ordinator of our group for Activity 2. I'm going to make a suggestion as to how I see us doing this activity but please feel free to make other suggestions. Could I ask that each of us responds individually to the three main points of the activity by Monday 11th? **(Organisational level discussion, BW).**

According to Conversational Framework, it might be categorised as the initial action. And they continue in a similar vein:

> **Participant T**: Sounds good to me. Thanks for doing this. **(Organisational level discussion, BW).**

This posting is the typical example of feedback to the proposed planning.

> **Participant D**: Thanks for getting us organised. **(Organisational level discussion, BW).**

The similar characteristic is once again reflected in this posting. The next one is a little different:

> **Participant D**: Hi everyone, here is my contribution - look forward to reading the others! **(Articulating individual views by submitting the initial posting, IV).**

This posting can be considered as the first admittance to start the discussion at the cognitive level, i.e. the discussion around the content, followed by another:

> **Participant P**: Attached is my attempt to digest all of the reading **(Articulating individual views by submitting the initial posting, IV).**

The similar nature of posting signifies that the group understanding can only be developed once the individual perceptions are externalised through words/presentations.

The next is different:

> **Participant K:** I've just had a quick read through everyone's contributions and it's reassuring to see that we've come up with a lot of the same points! **(Accommodating the views of others, direct agreement, PA)**.

This posting represents the successive stages of the cognitive processes, necessary for the transition from the lower mental functions to the upper one. As it has been suggested in the Murphy's model, when participants are exposed to each other's viewpoints, they begin to accommodate and reflect the perspectives of others.

The next posting even represents a more advanced cognitive process,

> **Participant P:** I have had a look at the others and like K said we have all pretty much pulled out the same elements. **(Accommodating the views of others, direct agreement, PA).** I do like the final point that K made in her contribution about Trade ....This was something I did not include and I think that it is a very crucial point **(Constructing through reflecting on the views of others, CCR)**.

This is like co-constructing through reflecting on the views of others. In practice, it is an example that how critical thinking ability could be emerged in the social learning environment, which might be resulted in the hierarchy of thought. Here the factual analysis and the comparison among the ideas resulted in the reorganisation of existing understanding:

The following post might be considered, as the preliminary effort by the coordinator to propose a group report, which requires extensive negotiation to convert it into the agreed group report.

> **Participant O:** I've attached the group report for Activity 2 **(The first version of the shared artefact, AD)**.

The second part of the discussion starts with the initial feedback on practice, i.e. to the group report.

> **Participant P:** I think that you have summed up really well and captured the essence of all the discussions. Should we include something about the

agendas of the larger charities..........? **(Practice level discussion, BW; Co-constructing shared perspectives and meaning by exploration of the theory, proposing extension, CA).** Let me know what you think **(Practice level discussion, BW; soliciting feedback, CF).**

Although an attempt has been made to modify the initial presentation by proposing extension, still it could remain just as the articulation of individual perspectives if it is not being discussed from the multiple perspectives in order to establish its relevance for the group report. As proposed earlier this posting can be emphasised as the first step towards the practice level discussion.

From the nature of the statement it might be said that the next post is the representation of the another version of the group report,

> **Participant O**: I've added a few points (highlighted) in the revised document **(The second version of the group report including the feedback from others, AD).** Let me know if you're happy with this or if I've gone on a tangent **(Practice level discussion, BW; Soliciting feedback, CF).**

However its characteristics still does not symbolise how far the participant is agreed to the proposition forwarded by others in the previous post. Instead it looks as if the suggestion has been added only as the possible elaboration of the report without any sincere discussion.

The following post supports the fact that shared artefact has proposed without any clarification of the meaning, or the inclusion of the proposed interface of negotiation which is necessary for the production of the artefact, representing the group understanding as a whole.

> **Participant D**: I'm happy for you to post this report **(Organisational level discussion, BW).**

Once again, what is needed for an effective practice level discussion, that multidirectional communication is relatively lost in the production phase.

Although 23 messages are not presented over here, still the general trend can be projected by categorising the messages in the different phases of collaborative interactions proposed in the modified Murphy's model.

Applying modified Murphy's model to Activity 2, group 2

Murphy (modified) category	No. of messages
Social presence (S)	20
Articulating individual perspectives (I)	3
Accommodating or reflecting the perspectives of others (P)	2
Co-constructing shared perspectives and meaning (C)	3
Building shared goal and purposes (B) Organisational level discourse Practice level discourse	 5 3
Producing shared artefact (A)	1

Table 8.3: The number of messages with distinctive characteristic from the discussion in Activity 2, group 2.

Since each message might contain several indicators, the total in Table 8.3, add up to more than 23 (the total number of messages in the threaded discussion).

From this summary description of the nature of the discussion, it is evident that there is little evidence of practice level discussion, which might be reflected in the quality of the shared artefact. The qualitative representation as well as through the distinctive nature of messages presented in Table 8.3 by using modified Murphy's

model capture the mechanism of knowledge construction in this particular activity as being primarily social, and not very constructive. In fact, in the name of collaborative learning, the shared artefact has been produced in the learning situation, however rather than representing the group cognition, the shared artefact remained as the presentation of individual cognition due to lack of extensive negotiation.

8.43 Activity 3, group 2: Analysis of messages

Exactly like the previous example of Activity 2, group 2, these two postings can be considered as the part of organisational level discussion.

> **Participant D:** I think it would be a good idea if we could all make our individual contributions by Sunday 24th to allow plenty of time for us to reach a consensus and get a group contribution together in time **(Organisational level discussion, BW).**

> **Participant J:** I have been aiming for your suggested timescale **(Organisational level discussion, BW).**

The following posts are the typical examples of articulation of individual perspectives, the preliminary requisite to initiate the discussion.

> **Participant D:** Please find attached my own contribution for this activity **(Articulation of individual perspective through contribution, IV).**

> **Participant O:** Please find my contribution attached **(Articulation of individual perspective through contribution, IV).**

> **Participant J:** Please find attached my contribution **(Articulation of individual perspective through contribution, IV).**

> **Participant K:** Have attached my contribution **(Articulation of individual perspective through contribution, IV).**

The next one combines several cognitive mechanisms like,

> **Participant K:** Have read all contributions now and feel there are a lot of useful thoughts particularly in J's ideas **(Accommodating the views of others, direct agreement, PA).** I do come from an environmental background so am interested in the concept of "genuflecting at the altar of balance". I think working in the DE field ....I already knew, not only economically and environmentally but also socially..... **(Co-constructing shared perspectives by proposing elaboration, CE).**

The post signifies the progress of the discussion along the consecutive steps of collaborative discussion, from accommodating the perspectives of others to an attempt to co-construct shared perspectives.

The next post is also a conventional response which implies that it is not always possible to resolve the problematic character of the personal understanding internally, particularly when it is provoked by other people.

> **The next post by participant K:** What is the thinking behind "education" if it's not for social change? How does our own experience of education dictate our current view of education? Are the values we learn as young children more important than our formal education in determining our view of life? **(Exploring the theory, asking for clarification, EA).**

It also signifies the fact that in such specific case, the individual may need to enter into an explicitly social process and create new meanings collaboratively.

This posting represents several cognitive activities required for the general success of collaborative interactions,

> **Participant O:** Looking back at my rationale, when I spoke of the global dimension, I was thinking of it in general terms rather than the formal education concept that K mentions. If I were to think of it in those terms I would place it where K has it on her diagram **(Constructing through reflecting on the views of others, CCR).** As these types of education are, to use D's words, continually being informed and informing, do they ever get to the point of 'transformation'? **(Co-constructing shared perspectives by exploring the theory, asking for clarification, CA).** Moreover, each adjectival education has its own ...individuals to transform

their thinking. Does this make any sense!? **(Responding to question, CR)**. OSDE (www.osdemethodology.org.uk) proposes that ....conducive to transformative learning **(CIR, Sharing information resources, CCR)**.

However, as usual we can only observe the effect of certain cognitive mechanisms (like responding to questions or sharing information resources reflected in the post) on others, if the interlocutor is prepared to externalise the change in their own understanding because of this specific action.

The next posting is the initiation to create the shared artefact, i.e. the initial message for the second part of the activity.

> **Participant D:** Please find attached my attempt at a group contribution **(The production of initial shared artefact, AD)**. I actually found it really difficult to bring together everyone's idea. As was noted in our contributions, each person's view/diagram/rationale is influenced by their own experience. Therefore, it was very difficult to discard elements of anyone's contributions. I was also concerned that in our rationale, I was providing definitions rather than explanation.

As we know the mechanism of creating the shared artefact is not all about to include or discard the propositions of individual's contribution, the relevance of specific information can only be decided if it is extensively discussed from the multiple perspectives of several participants. Therefore, if the information is not negotiated previously, it is difficult to construct the shared perspectives of meaning; the shared artefact could be just the accumulation of various propositions.

> **Participant O:** I think you have got all of the main points across from our contributions **(Practice level discussion, BW; Accommodating the views of others on the practice, direct agreement, PA)**. The only sentence I would query is. 'All of these separate/distinct 'educations' do not have much of a relationship with each other.' Does this contradict what we say elsewhere? Or perhaps I have misinterpreted this? **(Practice level**

discussion, BW; Co-constructing shared perspectives by asking for clarification, CA).

The suggestion which I made earlier is exactly reflected in the posting. According to its internal meaning, the shared artefact is the composition of main points across from the contribution. However this sort of collection of different information can be done without significant discourse, although in the end this collection cannot represent the group understanding precisely.

Participant D: I will have another look at that sentence and post an edited version in our group's space this evening **(Organisational level discussion, BW).**

The next post by participating D: I'm attaching a slightly edited version of our final submission **(The production of revised artefact, AD).**

The above mentioned postings represent the process of developing the shared artefact which we observed in the example of previous group, where the shared artefact has been created without significant negotiation among group members.

Among the 20 messages in the threaded discussion, only 13 messages are represented here to capture the mechanism of knowledge construction through mutual negotiation. In fact the remaining messages are either representing the dialogue in the meta-communicative level i.e. the simple social interaction with one another; or the lower order cognitive mechanisms like the articulation of individual perspectives. To comprehend the general trend, the modified Murphy's model has been used to categorise the messages in terms of their contribution towards collaboration.

Applying modified Murphy's model to Activity 3, group 2

Murphy (modified) category	No. of messages
Social presence	18
Articulating individual perspectives	4
Accommodating or reflecting the perspectives of others	3
Co-constructing shared perspectives and meaning	3
Building shared goal and purposes	
Organisational level discourse	5
Practice level discourse	3
Producing shared artefact	1

Table 8.4: The number of messages with distinctive characteristic from the discussion in Activity 3, group 2

Since each message might contain several indicators, the total in Table 8.4, add up to more than 20 (the total number of messages in the threaded discussion).

The summary description of the nature of the discussion (Table 8.4) clearly depicts the fact that there is relatively high number of messages in the organisational level discourse, compared to the practice level of discussion. Therefore, as usual the lack of communication in the practice level to develop the shared artefact might cause the natural consequence on the quality of the shared artefact. The representation can demonstrate the composition of individual

perspectives as opposed to any transformation into the group understanding through mutual negotiation.

8.44 Activity 3, group 4: Analysis of messages

The first couple of messages are an instance of organisational level discussion, which is required to complete the collaborative task in a co-ordinated way.

> **Participant T:** I have been assigned to be the facilitator for this activity. I am keen to hear what suits you all in terms of pulling this piece together. I am happy once we have completed our individual diagrams to try and pull it together into a group diagram. Although someone may have a better strategy than this, please let me know **(Organisational level discussion, BW)**.
>
> **Participant Sa:** Your plan for coordinating this sounds fine to me **(Organisational level discussion, BW)**.
>
> **Participant S**: I am glad to be in your group, and happy with your strategy T **(Organisational level discussion, BW)**.

The next posting is quite significant in terms of its contribution in the overall discussion process.

> **Participant T:** I really liked how N, pointed out that DE is very much about the process and perhaps more so than others, yet it is a process that can be employed by all the other educations, and in fact I would state that not to have this process as the foundation of many of the others surely contradicts what the education is aiming for **(Accommodating the views of others, agreement, PA)**........What does everyone else think on this point? And also on Education for equality? **(Co-constructing shared perspectives by soliciting feedback, CF)**.

The message has been categorized as accommodating the views of others through agreement. However, the participant not only simply considered the perspective presented by other, but also skilfully analysed and evaluated the information which is explicitly observable from her posting. Most importantly, she clearly highlighted her justification in terms of how it is related to the existing beliefs.

Considering the theoretical proposition of intersubjective learning in the collaborative situation, even in the agreed scenario, the participant should provide enough rationale/justification which might reflect the individual's own interpretation of the concept which could be resulted in providing the impetus for others to analyse the information and compare it with their personal experience/understanding. Therefore, it can create the environment for the further negotiation. This assumption is quite supported by the additional component of the above posting where the participants asked for further feedback to her proposition.

The characteristic of the previous posting is also reflected in this one.

> **Participant S:** Our course deals with development education, therefore the diagram of T seems to be very appropriate, placing DE in the centre. It is embedded in Education for Transformation and a global/local focus, both foci should never 'walk alone', I like that **(Accommodating the views of others, agreement, PA).** N, I like the preliminary exploration, which explains the connection between Global Citizenship **(Accommodating the views of others, agreement, PA).**

The message represents an elaborated explanation in terms of individual justification of the agreed proposition.

As suggested earlier, in the collaborative situation, it is important to consider how the participants have perceived other's interpretations of the phenomenon, and how they have worked on them to improve their current understanding. Therefore, along with the accommodating the perspectives of others, further analysis is also important for the restructuring of the cognitive system. This characteristic is very much obvious in the following message.

> **Participant N:** From my point of view the disadvantage of S's representation is that it does not explicitly indicate the linkages between the different planets and how much their dances overlap? Don't you think it is necessary to think about all these links? **(Inviting thought and discussion, CP).** I guess I am suggesting we try to draw a ceilidh! **(Proposing alternative suggestion, CE).** T's diagram shows the

interconnectedness between the different concepts. This understanding of the connections is one of the strengths of DE in that in our local practice we are frequently able to see the links between different concepts and how the concepts are able to complement each other **(Accommodating the views of others, agreement, PA)**. T, why are Global Dimension and International Education at the bottom? Are they excluded from the circular relationship? **(Exploring the theory or concept, asking for clarification/elaboration, CA).**

The message also signifies the fact that in the process of restructuring the cognitive system, new idea could emerge as an alternative of the proposed justification provided by others, which needs mutual clarification to establish the proposition as a shared knowledge. Similarly, it is not always possible to resolve the problematic character of the personal understanding internally, particularly when it is provoked by other people. Therefore, the participant might need further clarification or elaboration of the concept for internalizing the alternative interpretation.

This posting is entirely different from the previous one, as it is much more focused towards the second part of the activity. As I have described previously, the concept of a shared goal has been included in the task design, therefore rather than focusing on the individual construction of knowledge, the group members are aware of the production of the shared artefact as the symbolization of the group understanding. This posting represents the negotiation of the shared goal along with the acknowledgement of other members' required involvement in the production phase of the shared artefact.

> **Participant T:** As a basis of our agreed diagram, let's start with S's diagram. As you suggested, I would also like to show that this is all encapsulated within Education for Transformation and the local and the Global circle. Let me know, what you would like to see specifically and I will move the planets. Are there other 'planets' you would like to add in? Or move drastically? Keep in same place, beside others? Then hopefully by tomorrow evening I should have a revised diagram reflecting everyone's ideas ready for everyone to check over and agree. **(A strategic proposal for working together towards a shared goal, BW).**

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Moreover as this particular participant has been appointed as the coordinator of group, it also signifies the advantage of appointing the coordinator for the negotiation of the shared goal as well as for the coordination of the task.

The next posting is the initial proposition of a knowledge artefact.

> ***Participant T:** Here is my first attempt to gather our diagrams into one - not an easy task. Let me know how you think it is coming on and what other moves I need to make in order to get it as close as possible. **(The production of the initial shared artefact, version1, AD).**

From the perspective of the Conversational Framework this is the proposed action to meet the specified goal. However its modification needs the feedback from others for the production of revised action.

The next posting seems to look like the modification of the initial shared artefact through feedback.

> ***Participant T:** I made a few changes to the first draft not much and added a little (not academic) explanation for some of the moves **(Shared artefact, version 2, AD).**

However, looking back to the postings the previous one and this one (marked as *) has been posted by the same participant (Participant T). Therefore the modification is not the result of incorporating the feedback from others. It is just the elaboration of the idea by this particular participant. However, the knowledge artefact cannot be represented as the representation of the individual cognitive system. Any changes to the proposed model should be explicit to the others as an extensive negotiation is needed to establish the changes as the group knowledge. Consequently the modified diagram with the proposed changes can only represent the group understanding if it is being supported by other members of the group.

Compared to this one, the next posting can be categorized as the feedback to the previous version of the shared artefact as in this case the reaction to the initial presentation has come from a different member of the group.

> **Participant N:** I agree with you about the interconnectedness **(Practice level discussion, BW; The agreement after accommodating the views of others on the practice, PA)** and wonder if we should go further and place Anti Racist Education and Peace Education and Education for

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Inequality INSIDE Human Rights Education. Similarly how about placing Environmental Education INSIDE ESD? **(Practice level discussion, BW; Proposing some alternative suggestions, CE).** ....What do you understand by Education for All? Is this also part of Human Rights Education? **(Practice level discussion, BW; Asking for clarification, CA)**......................Education for social change website states "education is the driver for positive social change, allowing people to participate in society, stand up for their rights, challenge the causes of inequality and live better lives." **(Practice level discussion, BW; Sharing information resources, CIR)**...........How can it be a negative if the educations don't understand how they fit together? **(Practice level discussion, BW; Inviting thought and discussion, CP)**.......I do think that one of our strengths in DE is that we see the broader picture and certainly in my organisation we have to work in partnership with other organisations due to our lack of capacity. But does this make DE too accommodating to the agendas of others? Does it dilute the DE process? **(Practice level discussion, BW; Inviting thought and discussion, CP).** I have put these ideas on an adaptation of the diagram. **(The shared artefact, version 3, AD).** Please comment! **(Practice level discussion, BW; Soliciting feedback, CF).**

In fact these feedbacks are an illustration of the individual understanding of the concept. Some of the individual thoughts are incorporated in the existing artefact to create a new version, which is subjected for further negotiation.

Similarly, from the perspective of Conversational Framework, the next posting can be categorized as the feedback to the existing shared artefact.

Participant S: I like the changes you made, T! Especially the frame! And also the re-grouping of the planets makes sense to me **(Practice level discussion, BW; Accommodating the views of others, direct agreement, PA).** I only have a few suggestions **(Practice level discussion, BW; Proposing elaboration, PEE).** International Education a bit further away from the others to express, what N said about it **(Practice level discussion, BW; Articulation of individual views on the practice,**

IV). Should we cut out road safety education? **(Practice level discussion, BW; Soliciting feedback, CF).** I only put it, because in Germany ESD tries to include everything, even this **(Practice level discussion, BW; Articulation of individual views on practice, IV).** Should we also cut out economic education? **(Practice level discussion, BW; Soliciting feedback, CF).** I am not sure any more, where I took that from **(Practice level discussion, BW; Articulation of individual views on the practice, IV).** N - you asked, what "education for all" is - what I meant was Millennium Goal 2, quality education for all children in the world, which is part of the definition for ESD, in a worldwide context **(Practice level discussion, BW; Responding to question, CR)**....... But now that I think of it, it is a vision or an aim, and not an educational concept **(Practice level discussion, BW; Constructing through reflecting on the views of others, CCR).** T, could you make the final changes according my and N's ideas? I have already made slight changes in the diagram just to add the input from our discussion.

The critical analysis of this message demonstrates that there is a 'communication cycle' apparent here, because there is an iteration across several participants which is shown in the Conversational Framework as an iteration around the different loops. This communication cycle has its own attributes in terms of individual learning as well as for the enrichment of the group understanding. Through reflecting the views of others the learners can get the opportunity to analyse their previous understanding of the concept which might result in the development of new knowledge. At the same time this course of communication is a part of negotiation which is necessary for the modification of the knowledge artefact in a direction that is likely to promote consensus.

From the perspective of the Conversational Framework this posting is the illustration of reflection and adaptation of the proposed suggestions for the development of modified revised action.

> **Participant T**: I agree that we should move International education out further as this is what I thought too at the beginning. And I will delete Road safety education and Education for All as I agree with your thinking

about that, Education for All is encompassed in Human Rights and many others, so it is more of an aspiration than a theory. **(Practice level discussion, BW; Constructing through reflecting on the views of others, CCR)**. Great idea N, about the arrows between the local and the global as that fits with what I think about them in terms of the ever moving relationship between them as it is not a static thing. And placing the photos there was a good idea too, **(Practice level discussion, BW; Accommodating the perspective of others, direct agreement, PA)**. I have though moved them a little, so that they each sit at a global and a local - as a way of illustrating that our Global is someone else's local and vice versa (another's Global is our local). **(Practice level discussion, BW; Proposing elaboration, CE)**. I totally agree with moving antiracist education, peace education and education for inequality all inside HR ed. and Environ education within ESD **(Practice level discussion, BW; Accommodating the perspective of others, direct agreement, PA)**. Not sure what to do with Economic Education - this is a very specific type of education, but yet is important in the understanding of the world and the issues that we deal with. So I do think it needs a place somewhere on the diagram – **(Practice level discussion, BW; Articulation of individual perspectives, IV)**, just not so sure where. **(Practice level discussion, BW; Asking for clarification, CA)**. I have placed it on the edge of the larger Education for Social Change planet - giving it a place but not too near all the others .What you think? **(Practice level discussion BW; Soliciting feedback, CF)** I also think that we need to affirm the education for transformation and education for social change – as you pointed out N they do work towards a combination of the aims of many of the other types of education **(Practice level discussion, BW; Accommodating the perspective of others, direct agreement, PA)**. So as you had done -I have just highlighted that the larger central planet is Education for social change and I have placed Education for transformation above all, almost as a title that covers all of the planets below – May be this is the name of this planetary system? **(Practice level discussion, BW; Articulation of individual perspective, IV)** Then I remembered that S original title was Education for Transformation - so tick, we are all thinking the same on

this one **(Practice level discussion, BW; Accommodating the perspective of others, direct agreement, PA)**.

In fact this posting demonstrates the value of other learners in prompting that cycle through reflection and adaptation in order to produce a shared artefact. This is a very nice representation of the cycles of iteration. Not only has this posting emerged as the possible consequence of reflection and adaptation of the previous postings, but also it can facilitate the further course of interactions with others. In fact, the next post itself supports this assumption.

> **Participant T:** N - I hope I can answer your questions, I think what I understand by educations not fitting together as a negative, is that we all are working for the same goal......... I think ultimately it helps make all of us make sense of the bigger picture and see where all the many pieces fit together and that essentially it is important that we work together - because with elements missing we don't get any closer to the ultimate goal **(Practice level discussion, BW; Responding to question, CR)**.

This is the example of another attempt to establish the group meaning by providing the elaboration for the better comprehension of the topic by other individuals.

The next posting in the form of an elaboration itself represents the feedback to the existing model of the shared artefact.

> **Participant Sa:** One planet that we could add from the readings would be Selby's take on global education as Global Competitiveness Education. I think it would be in orbit somewhere near International Education due to its focus on global competitiveness, its uncritical approach and lack of value base which would position it fairly far away from the sun that is 'development education' **(Practice level discussion, BW; Proposing elaboration or extension, CE)**............ It occurs to me that this may be what we are referring to with Economic Education though – or is this something else? **(Practice level discussion, BW; Asking for clarification, CA)**.

Here once again this posting supports the fact that to achieve the purported outcome of collaborative interaction, the Conversational Framework should be represented as an integrated part of the negotiation, which would be helpful for the individual learning as well as for establishing the joint understanding by the group as a whole.

The characteristic of reflection and adaptation for the refinement of the proposed shared artefact is explicitly highlighted in the following postings.

> **Participant N**: I am happy with the changes to the diagram that you suggest and **(Practice level discussion, BW; Accommodating the perspective of others by direct agreement, PA)**. Please, go ahead and make the changes **(Organisational level discussion, BW)**. Interestingly T, the bit in my rationale about Global competitiveness education I pulled from your work **(Practice level discussion, BW; Co-constructing through the reflecting on the views of others, CCR)** and no, it hasn't been put on the diagram yet. **(Practice level discussion, BW; Responding to question, mainly the question posed by Sa, CR)**. S, could you add it in near to International Education? **(Organisational level discussion, BW)**.

> **Participant S**: Another version of the diagram, there you go ... **(Another version of the shared artefact, AD)**. Feel free to wish changes, **(Practice level discussion, BW; Soliciting feedback, CF)**.

This is the revised version of the group diagram including the feedbacks proposed by others. However the process of inclusion results from the process of mutual negotiation. In this context, it is important to highlight that the successive processes of reflection and adaptation are really internal to the learner. In case of any learning situation, whether it is an individual learning, or group learning, even in case of formal or informal learning these processes are the integral part which is required for the development of new knowledge through the reorganisation of initial understanding. However, in case of individual learning these internal processes could be hidden within the head of individual, whereas in case of collaborating learning they should expressed explicitly through the discussion. There is an essential need to elicit those internal processes through certain

mechanisms like comment on each others' points as in case of collaborative interaction the state of evolving knowledge must be continually displayed by the collaborating participants to each other.

At this point, to represent the general trend of discussion pattern for the Activity, I have applied modified Murphy's model to categorise the messages along the continuum of collaborative discussion phases.

Applying modified Murphy's model to Activity 3, group 4

Murphy (modified) category	No. of messages
Social presence (S)	63
Articulating individual perspectives (I)	4
Accommodating or reflecting the perspectives of others (P)	5
Co-constructing shared perspectives and meaning (C)	4
Building shared goal and purposes (B)	
Organisational level discourse	40
Practice level discourse	21
Producing shared artefact (A)	1

Table 8.5: The number of messages with distinctive characteristic from the discussion in Activity 3, group 4

Since each message might contain several indicators, the total in Table 8.5, add up to more than 66 (the total number of messages in the threaded discussion).

The above dialogues and the summary description of the nature of the discussion (presented in Table 8.5), explicitly indicate how socially shared meaning can be constructed in group interactions. In this case the idea of 'group meaning' can be observed in the tabular display of the discourse properties in Table 8.5. Here group meaning is constructed by the interactions of the group's individual members, where the members work for a shared purpose, and each and every interpretation of the individual actions is negotiated further among the group members before being accommodated into the shared artefact as the revised version. Therefore the ultimate outcome of 'group meaning' cannot be attributed to any specific individual, it is fundamentally the emergent property of the group discourse or negotiation. Here, the knowledge development in this process is not a result of the transition from the intra to the inter psychological plane; rather it is a result of an extensive iteration of communication through which the participants can create a new idea that preserves the value of the competing ideas while 'rising above' their incompatibilities (Scardamalia, 2004).

Furthermore, if we apply the fundamental proposition of the Conversational Framework, in terms of 'goal-action-feedback-reflection-adaptation-revised action', then the shared artefact can easily be considered as the ideal representation of revised action, as the overall process of its evolution has passed through all the previous consecutive steps, which is quite explicitly demonstrated in the course of dialogues.

On the one hand, the individuals learned as a result of group learning, which can be easily attributed as the immediate effect of socio cultural learning. On the other by working together towards the shared action, the group as a whole can learn together by interchanging their perspectives and then gradually converging them for the shared understanding of the meaning.

However apart from all these observations, there is something else in the discussion that seems important but is not captured so far, something that can change the existing theoretical framework of collaborative learning suggested by Laurillard (2009). In the article 'the pedagogical challenges of collaborative technologies' she proposed that collaborative learning combines constructionism with social learning. The additional value of this combination is the opportunity that learners have to share and discuss the actions they take, and the products they make, in the practice environment. This gives focus to their discussion, enables

them to learn from and build on the outputs of their peers, and to share their reflections and interpretations of what happened within their practice. And to represent this theoretical proposition, she advocated the following diagram (Fig.8.1) which shows how the two pedagogical approaches combine to provide much richer support for the learning process.

Fig. 8.1: Collaborative learning combines the pedagogies of constructionism and social learning to provide richer interactions between learners and their concepts and practice (Laurillard, 2009).

However referring back to the Activity 3, it could be said that the first part of the activity was the instruction to discuss the individual diagram which is based on the concept of 'education for sustainable development'. According to the concept of developing the artefact in the practice environment, Laurillard focused on the creation of individual artefacts, and she has highlighted the advantage of the extended discussion around those. As a consequence, the individual diagram created in the first part of the activity could be considered as the 'product', and the discussion around those diagrams could be considered as the extended discussion around practice, which is according to her perspective necessary to differentiate the collaborative learning from socio-cultural learning. In this instance, the productivity of the collaborative interaction should result in the multiple revised actions of the individual diagrams.

In this transcript we have never observed any revised action (modified individual artefact) proposed by individuals. However, even if there are multiple revised actions proposed by individuals, still it cannot satisfy the most demanding requirement of collaborative learning, i.e. the aspect of group cognition. Or in other words the discussion around the individual practice is not significantly different from what we might expect in the case of socio cultural learning (normal discussion based learning environment), where there is also a requirement to learn something from others, rather than just talking about a general theoretical concept, where the discussion might concern a specified object or presentation. In both of these cases, the ultimate learning objective is focused on the co-construction of a concept by the individual learners, and the learning outcome is very much confined within the epistemology of individual cognition happening within the inter-individual plane. It is desirable that collaborative learning should be a combination of social learning with constructionism, but in order to include the fundamental aspect of group cognition, there is a need to consider also the discussion around the shared artefact. Here the idea of constructionism should not be limited only to the production of an individual artefact; it should be extended in the production of a shared artefact, which will signify the cognitive achievement of the group as a whole.

> **Participant S:** I am absolutely thrilled by this process, esp. the way how my diagram became ours, fitting in the viewpoints of all of us.

> **Participant T:** I can see my ideas in there and that is great to see that they are not only included but that they were listened to.

In fact, from these two above mentioned posting it is clear that the collaborative learning is about the group cohesion. Knowledge here is not so much the ownership by individuals of mental representations in their heads as it is the ability to engage in appropriate displays within the social world (Stahl, 2002).

8.45 Activity 6, group 1: Analysis of messages

The first three postings are the usual feature of organisational level discussion corresponding to the demand of the task to produce the agreed group report.

> **Participant S:** How can we be effective and post our report ASAP? I have a suggestion: we post our Mails following this structure..........If everyone contributes to these points and tries to keep it short, I could volunteer, to combine, reduce and summarize. Is that a good plan? **(Organisational level discussion, BW).**

> **Participant J:** I will try to do as you have suggested as soon as possible **(Organisational level discussion, BW).**

> **Participant O:** I absolutely agree with this strategy **(Organisational level discussion, BW).**

Once again these messages clearly signify the fact that the proposition of the Conversational Framework, i.e. goal-action-feedback-revised action is an essential feature in the organisational level discussion if the participants are to achieve the desired consensus for accomplishing the collaborative task.

The next two postings are the regular feature of articulation of individual perspectives.

> **Participant S:** I thought I send you my first ideas on this activity, may be the document can grow **(Articulation of individual views, IV).**

> **Participant O:** I've added my contribution below..... **(Articulation of individual views, IV).**

However considering the nature of the following posting, it is quite obvious that among the six steps of collaborative interactions suggested by Murphy, in this situation no higher order discussion is apparently visible. The next posting is an

initiation to produce the shared artefact ignoring all the intermediate steps which should be achieved through extensive negotiation.

> **Participant S**: We are all heading for our assessment 2 now. I wrote a draft, on the basis of what I did before including some of your precious ideas, O **(The production of shared artefact, AD).**

From the nature of the above mentioned dialogues, it is quite clear that the fundamental discussion around the individual contribution did not move beyond the initial attempt through the articulation of individual perspectives.

> **The continuation of the above post made by participant S**: O, so please read it, and makes suggestions, how to change/modify/shorten it, and we post it later **(BW, practice level discussion, BW; Exploration of the theory, by soliciting feedback, PEF).**

> **The next post by participant S**: I didn't hear anything from you. I hope you agree as a group product **(Organizational level discussion, BW).**

> **Tutor:** Thanks to O and S for their excellent and thoughtful contributions to this activity. I know that time is scarce at the moment, especially as you are all now working on assignment 2, but please do finish this activity by posting a group response in the main discussion space.

Through the demonstration of most of the messages in the threaded discussion, once again the practice situation reconfirms the fact that, because of the tremendous contextual pressure the participants did not get any opportunity to achieve the expected outcome of collaborative learning.

Furthermore, this assumption is very much supported by the overall presentation of the messages under different categories of modified Murphy's model.

Applying modified Murphy's model to Activity 6, group 1

Murphy (modified) category	No. of messages
Social presence (S)	8
Articulating individual perspectives (I)	2
Accommodating or reflecting the perspectives of others (P)	0
Co-constructing shared perspectives and meaning (C)	0
Building shared goal and purposes (B) Organisational level discourse Practice level discourse	4 1
Producing shared artefact (A)	1

Table 8.6: The number of messages with distinctive characteristic from the discussion in Activity 6, group 1.

Since each message might contain several indicators, the total in Table 8.6 adds up to more than 10 (the total number of messages in the threaded discussion).

The inadequacy in the practice level discussion has impacted clearly on the extent of discussion of the shared artefact.

8.46 Activity 6, group 2: Analysis of messages

Participant K: Thought it might be useful if I posted up my first thoughts/analysis of some of the readings **(Articulating individual views by submitting the initial posting, IV)**.

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Participant D: Please find my summary of the reading attached (**Articulating individual views by submitting the initial posting, IV**).

Participant E: I'm really sorry - I'm being terribly behind with this activity. I am tackling the reading now and will endeavour to post something in the next couple of days.

Participant N: Sorry all- not even had chance for the reading yet. I'm not going to post unless I suddenly find extra few days. Apologies.

Participant E: I've done most of the reading and made some sketchy notes but nothing that is presentable to be posted. I'm now starting to panic about getting on with assignment 2...... Sorry to let the group down on this activity.

Participant K: I've posted up some thoughts on the questions asked in the group work section of Activity 6. My time is v. short at the moment to do this work so hope this is OK. Sorry that it doesn't reflect the wider group thoughts.

Tutor: Many thanks to K and D for their wonderfully detailed posts for this activity. I know that time is incredibly short at the moment, especially as you are all working on assignment 2, but would be great if you could post something in the main discussion space. If you don't have time at this point to collate K's and D's responses, feel free to simply post them both as your group contribution.

The unique nature of these postings shows that in fact there is no substantial discussion; however it has its own significance by highlighting the practical issues of maintaining the quality of the collaborative work.

The general trend of discussion can be represented by using modified Murphy's model across all the messages in the threaded discussion.

Applying modified Murphy's model to Activity 6, group 2

Murphy (modified) category	No. of messages
Social presence (S)	9
Articulating individual perspectives (I)	2
Accommodating or reflecting the perspectives of others (P)	0
Co-constructing shared perspectives and meaning (C)	0
Building shared goal and purposes (B) Organisational level discourse Practice level discourse	0 0
Producing shared artefact (A)	1

Table 8.7: The number of messages with distinctive characteristic from the discussion in Activity 6, group 2

Since each message might contain several indicators, the total in Table 8.7, adds up to more than 9 (the total number of messages in the threaded discussion).

From this summary description of the nature of the discussion, it is evident that in this learning situation no endeavour has been made to integrate the idea of collaborative discussion. The previous illustration of the messages has already suggested the issues that have obstructed the optimal outcome of collaborative learning.

8.5 A critique of the outcome of the analysis of the threaded discussions in Case Study two

This Case Study has provided a unique prospect to observe a substantial number of collaborative interactions (the threaded discussion in group 4, around the Activity 3). At the same time the outcome from the successive analyses reinforced the proposition that the mere existence of any shared artefact cannot be considered as the single determining factor to ensure that a learning environment is a collaborative one.

However, apart from the protracted negotiation in group 4, for Activity 3, the outcome of the analyses of all other threaded discussions for Activity 2, group 1; Activity 2, group 2; Activity 3, group2; Activity 6, group 1 and Activity 6, group 2; signifies a different characteristic of learning mechanism which is significantly different from the theoretically prescribed mode of collaborative knowledge construction.

In these examples, the production of shared artefact was nothing but the simple inclusion of the information provided by different participants, although we know the mechanism of creating the shared artefact is not all about to include or discard the propositions of individual's contribution. The relevance of specific information can only be decided if it is extensively discussed from the multiple perspectives of several participants. Without clarification of differences in interpretation and terminology, it is impossible to converge multiple perspectives for the construction of shared understanding. Therefore, in every interactional space although one diagram has been created as 'an agreed diagram of the group', still from the perspective of practice level discussion, the quality of the artefacts was inadequate to perceive it as a shared one.

From the methodological perspective, this case has distinguished the significance of the practice level discussion which was not particularly highlighted in the existing model of Murphy. The analysis of the threaded discussion clearly signifies the fact that as an obvious approach to capturing the dynamics of collaborative interactions, two possible categories might be included in the existing model as 'organisational level discussion to accomplish the collaborative task' and second 'the practice level discussion to produce the shared artefact

through extensive negotiation'. Moreover, as we observed, the practice level discussion is the extended theoretical discussion around practice; therefore the original attributes of theoretical discussions like 'articulation of individual perspectives about initial practice/artefact', 'accommodating the prospective of others' , 'co-constructing the perspectives', and finally 'the production of revised artefact' should be integrated as part of the practice level discussion.

Apart from this, we can say that analysis of the threaded discussions, especially the nature of the involvement of the tutor did reflect the recommendation which has been suggested by Laurillard quite long time ago in 2002, in her book 'Rethinking University Teaching'. She proposed that to achieve the effective learning outcome, the tutors should make sure that the demands of the context are compatible with their pedagogic intentions. In most of the incidents we have observed that the teacher's requirement was quite successfully construed by the participants; however the demands of the overall learning context were so impractical that the participants did not obtain sufficient time to involve themselves in productive discourse. If the pedagogic intention is the development of group understanding, then this objective cannot be attained by compromising its determining factor, i.e. protracted negotiation.

It is important to consider also the perception of the tutor about collaborative interaction to make a connection between the attitude and practice.

8.6 Analysis of the interview data

In this analysis, I will represent the information which I acquired in the course of the semi structured interview with the tutor. The analysis of the interview data is grounded on the hypothesis that teachers' beliefs about computer-based instruction may have an influence on their classroom behaviour (Webb & Cox, 2004).

1. According to your perception what is collaborative learning?

> **Response:** It is for me, a context in which learners assist each other, sharing resources, ideas, etc, especially it is a context in which learners work together jointly on the same task.

It is true that participants can work together jointly, assist each other, and share resources, in the context of socio-cultural learning, collaborative learning and cooperative learning. However the associated processes through which participants accomplish the job depend on three distinct pedagogical demands of the learning situation. Therefore, the genuine attainment of the collaborative interactions can only be gained if the tutor can differentiate it from other forms of socio-learning.

2. Do you expect any distinctive learning outcome from the collaborative approach?

> **Response:** It is generally believed that collaborative learning is beneficial to individual learning and that good teamwork skills may develop. Especially in this sort of courses, the people come from different backgrounds and this collaboration forces these different backgrounds to interact with each other, therefore there is a greater chance to expand knowledge.

Here once again, we can observe that no significant differentiation has been made by the tutor in terms of learning outcome of collaborative learning from the other approaches of social learning. In the response, the importance of explication of individual understanding has been reinforced and even the value of discussion has been emphasised but there is no specific indication has been made in terms of joint construction of knowledge through the production of shared artefact. Or in other words the aspect of joint production has been reinforced in quite significant way as opposed to the development of group cognition. It is true that that the production of a shared artefact was the general requirement for each and every activity. However the characteristic of the tutor's posting in the threaded discussion explicitly exhibited that in terms of her individual interpretation, the development of 'agreed report' or 'group diagram' could be an approach to summarising the information rather than interactively produced piece of knowledge.

3. What are the conditions (or factors) you have to take into your consideration to make collaborative learning successful?

> **Response:** Mainly I consider how the collaboration is set up, especially the structure of the task and the way it has managed.

We have already admitted the importance of the task design of this Case Study; however how far it has managed to achieve a collaborative outcome is rather questionable. If the objective of the task design was to develop the group understanding as a whole, then first of all the process of creating the artefact should be guided through the process of extensive negotiation. And secondly, the overall structure of the course should provide ample time for the participants to discuss their multiple perspectives for the shared understanding of the meaning, as opposed to accumulate the various informations to represent the group understanding.

4. In terms of your perspective what would be the tutor's role in the effective collaborative discussion?

> **Response:** According to my view the main role of the tutor's would be to establish a sense of community along with to provide positive supportive feedback for facilitation.

During the analysis of the threaded discussion we have observed a particular type of connectedness among the participants, especially a sense of community has been observed in the organisational level discussion or at the meta-communicative phase of interactions. Most of the instances of group cohesion which were observed in the organisational phase were not so obvious during the practice level discussion. Therefore the characteristic of the 'community' was much more restricted within the scope of 'social community' as opposed to the 'learning community'. To achieve the desired outcome of collaborative interaction there should be a co-existence of these two different kinds of community, otherwise the concept of 'group attainment' would be practically unattainable. And for this requirement the feedback provided by the tutor should motivate the participants for the iterative course of communication to achieve the learning outcome as a

'group' not as an individual of the community. In practice, the analysis of the threaded discussion, notably the characteristic of the tutor's posting clearly reveals the fact much attention has not been paid to create the learning community, therefore it could be quite justifiable to assume that for her the sense of 'community' is very much an attempt to make a mere connection among the participants.

5. How can you ensure the maximum participation in the collaborative discussion?

> **Response:** We have an attendance requirement, but it is an informal one. We make it very clear that if they don't take part in all the activities, it would be very unlikely to pass the assignments, as all the activities are built up around the assignments. Honestly, there is an expectation, than the actual rule.

In this context it is worth considering that even in case of 100% participation, the quality of the collaborative interactions cannot be achieved if the entire purpose of collaborative interactions has not been conceptualized by the participants. As cited earlier, it is a very specific act of social learning; therefore the orientation of participants' attitude towards collaboration should be reformed as opposed to representing collaboration as an alternative means of completing the assignments. Even the analysis of the threaded discussion supported the fact that most of the cases in the name of 'shared artefact' the participants have just accumulated the information to satisfy the attendance requirement which has a detrimental effect on the collaborative discourse to produce the artefact.

8.7 Conclusion

The analysis of this Case Study has revealed the interdependencies among the nature of task design, the characteristics of the discourse, and the role of the tutor, in the following ways:

Factors	Case Study one
Tutor's perception of collaboration	Uses collaboration but limited to joint production
Nature of task design	Explicit about collaboration
Tutor's role	Encourages development of the joint production
Low level messages	155
High level messages	106

Table 8.8: Summary of the findings of Case Study two

Since each message might contain several indicators, the total in Table 8.8 adds up to more than 138 (the total number of messages in the threaded discussions of Activity 2, group1; Activity2, group 2; Activity 3 Group 2; Activity 3, group 4; Activity 6, group 1; Activity 6, group 2).

The number of low level messages is the sum of all the messages, across all the activities in Case Study one, that are categorised as: 'social presence' (S) + 'articulation of individual perspectives' (I) + 'accommodating or reflecting the perspectives of others' (P).

The number of high level messages is the sum of all the messages, across all the activities in Case Study one, categorised as 'co-constructing shared perspectives and meaning' (C) + 'building shared goal and purposes' (B) + 'producing shared artefact' (A).

From this tabular representation (Table 8.8), it is quite clear that,

- The purported outcome of the collaborative interaction can only be achieved by conceptualization of the phenomenon as a process of constructing meaning through mutual negotiation where learning is not only accomplished through the interactions of the participants, but also consists of those interactions (Koschmann et al., 2005).

- This conceptualisation is so important that the apparent success of designing the activities cannot in itself provide enough support to achieve the desired outcome of the collaborative interactions. The demand in the learning environment for the production of a shared diagram or rationale can influence the interaction to some extent, but if the collaborative interaction has not been conceptualised as the achievement of the group through the mutual negotiation, then the artefact could remain as the compilation of the individual ideas.

- Furthermore, this conceptualization has had its impact on the general structure of the course design. If it is assumed to be similar to the approach of socio-cultural learning then the time required for discussing a topic would be much shorter than the time required for establishment of a joint understanding. In this case we have observed in most of the instances that participants did not get sufficient time to establish the common understanding in the group.

- However, this Case Study also offered an example of an ideal sequence of collaborative interactions which specified what could be expected in the formal learning environment to accomplish the process of collaboration. This success also highlighted the significance of conceptualization of the term by the participants as well.

Consequently, it can be said that the task design and the nature of involvement of the tutor in the discourse are very much dependent of the interpretation of the term 'collaboration' mainly by the tutor. It is true that the behavior of the participants in the practice situation can be influenced by their own interpretation or the previous experience of the collaborative learning (i.e. the influence of internal script), but this interpretation could be modified by the new way of communicating if the concept is clear in the tutor's mind. As we have observed in this particular Case Study if the collaborative interaction is going towards the effective outcome (like the example of Activity 3, for group 4), there is no need to worry, but if it is not then the tutor is the prime factor who can steer the dynamics of interaction towards the desired destination. Therefore, rather than assuming that collaborative learning is a similar approach of socio cultural learning, the tutor should be very precise in differentiating this pedagogical approach of teaching

and learning as an unique form of interaction which should result in a very specific tangible outcome.

Chapter nine: Case Study three

9.1 Case Study three

This Chapter will represent the Case Study three, which will include the presentation of the threaded discussions along with their subsequent interpretations. The efforts will focus on identifying the existence of collaborative learning mechanism in the practice situations. As conditional effects of collaborative learning, the task designs and the perceptions of the tutor will also be scrutinized critically as having an immediate impact on the success of collaborative interactions.

9.2 Brief introduction of the course: Learning, Education and Development

This course is the core MA module, "Learning, Education and Development: Concepts and Issues".

The aims of the course are to:

- Introduce a range of concepts, issues and theories from the social and political sciences that assist the understanding and analysis of the relationship between education, learning and international development in low and middle income countries;
- Explore critically the changing links between these relationships at individual, local, national, regional, international and global levels;
- Introduce and discuss issues of educational policy and practice in low and middle income countries.

The module is offered as a distance learning course tutored using Blackboard (Bb).

Activities	No of participants	Duration	No of tutor	No of messages in the overall thread
Activity 2.1	8	2-23 Feb 2009	1	18
Activity 2.3	9	2nd February to 6th March, 2009	1	29
Activity 2.6	4	2-17 Feb, 2009	1	10
Activity 5.1	7	17-31March, 2009	1	16

Table 9.1: The general overview of the course

The data and analysis of this case is described in the following sections.

9.3 Task design

As usual, in this circumstance, it is important to reflect on the general trend of task designs for the four different Activities under study. These were designed by the tutor as follows:

Activity 2.1

You have to represent your idea about 'Analysing Learning' according to the format prescribed below. Discuss about your presentation with others in your group.

Learning domain	Learning arena – the home	Learning arena – the school
Knowledge		
A skill		
A value		
An attitude		
A behaviour		

Table 9.2: Activity 2.1

Activity 2.3

You have to represent your idea about 'Analysis of Learning Arenas' according to the format prescribed below. Discuss about your presentation with others in your group.

Learning arena	School	Home
What is being learned?		
How is learning occurring?		
Why is the learner learning?		
Has learning occurred?		

Table 9.3: Activity 2.3

Activity 2.6

You have to represent your idea about 'Exploring Aspects of Equality in Education' according to the format prescribed below. Discuss about your presentation with others in your group.

Aspect of equality of education	Defining features of main characteristics	Educational policies which may facilitate greater equality in education
Equality of access		
Equality of participation		
Equality of processes		
Equality of results		
Equality of outcomes		

Table 9.4: Activity 2.6

Activity 5.1

In this activity we need to discuss about the following three questions.

1. What are some of the strengths and weaknesses of the SWAP approach to health development?

2. Are there any ways you can think of now to help educators and health workers to work better together? Think about how you work within your particular subject discipline. Are you working largely inside your subject box or trying to go beyond it?

3. Have you had any opportunities recently to work more broadly? What might be some of the implications and effects of breaking down subject walls and working in a more cross-disciplinary manner?

9.31 The analysis of task design

Before analysing the general trend of task design, it is important to note that,

- This course is aimed at developing a new understanding among young people who work in International education and development primarily in low and middle income countries.

- From this perspective, generally the objective of this course is not skill acquisition; it is mainly the restructuring of the concept about learning, education and development.

- And this sort of restructuring is only possible if the participants can evaluate their current understanding; can critically analyse their position in order to find out how the understanding of a new concept can bring radical change in their own practice.

Therefore, in terms of the task design,

- It should be developed in such a way, that the participants would be encouraged to bring real life into their discussion as much as possible.

- In other words, the tasks should be designed in such a way that can help the participants to make sense of the material on a very personal level.

From that point of view, in all these activities, there is a clear opportunity for the participants to reflect on the previous experiences of their individual contexts.

However students' choice of deep or surface approach and of operation or comprehension learning is dependent to some extent on the nature of the problem set and to some extent on their perception of the teacher's requirement (Laurillard, 1997).

From the apparent features of the task designs, it is obvious that,

- For all the activities there is a clear scope for mutual discussions as all the activities are based on the real life experiences.

- There is a space for shared knowledge construction as the activities demand the sharing of individual perception/experience of the participants of their individual context.

However as collaborative learning has been defined as a special act of socio-cultural learning, the tasks should include certain features which have already been defined in Chapter six, under the heading of 'task design characteristics'. From that point of reference, in this task design, there is a lack of certain considerations especially in the area of,

- Construction of the group.
- Instruction for the specific nature of the interaction and the process of collaboration.
- The absence of explicit formulation of the aim or purpose of the task.

In this context, the interpretation of the term 'discussion' might be restricted because,

- In the concept of socio-cultural learning, where the discussion could end in the sharing of information or an interpretation of a particular issue from a specific point of view; however, this is not sufficient for the shared construction of knowledge from the collaborative point of view.
- In practice this type of instruction can be ambiguous for comprehending the actual requirement of the task, as it is difficult to understand what would be assessed in the end: the change in the individual cognition (i.e. the individual understanding) or the overall understanding of the group.
- Furthermore, with respect to a collaborative learning environment, the aspect of 'internal script' could not be reinforced within this task design, as there is no external support through the direct instructional approach

However, the apparent weakness of task design can be balanced by the careful intervention of the tutor who can direct the discussion towards the effective collaborative interactions.

Still from the perspective of task design, it might be said that this sort of design is not sufficient to develop the collaborative knowledge where the diverse understanding of the individuals should converge for the development of actual group knowledge.

The following sections analyse the messages relating to these four Activities, and the outcomes they achieved.

9.4 The identification of the nature of collaboration in the threaded discussions

As mentioned earlier, in the process of analysis, modified Murphy's model was used to identify the existence of the six consecutive steps of collaboration in the threaded discussions in order to test the extent to which the discussion meets the criteria for being collaborative. Here, each message as a unit of analysis has been identified (the specific indicators under all major categories has used for identification, the detailed description has been provided in Chapter five), and categorised according to the six different phases of the collaborative process. Throughout all the activities the messages are presented in sequential order.

9.41 Activity 2.1 Analysing Learning: Analysis of messages

Like all previous cases, authors of postings are identified by initials only. Similarly, specific indicators have been used to express the characteristic of the messages, for example as proposed in Chapter five, the symbolic representation of IV represents the categorisation as 'Articulating individual perspectives'; PA, 'Accommodating the perspectives of others'; CA, 'Co-constructing shared perspectives' etc). In each case the quote is categorised and then interpreted for its pedagogical significance in relation to the theory.

Typically, the tutor's role should be measured using a model proposed by Anderson et al., 2001, by categorising the messages posted by the tutor into three major categories: 'Design and organisation'; 'Facilitating discourse' and 'Direct instruction'. The detailed description of this model has been presented in Chapter five.

It is impossible to represent all of the 18 messages in this section. Consequently, the messages are selected to represent the cognitive dimensions of collaborative interactions.

As usual in the threaded discussion around Activity 2.1, the initial posting is an effort to initiate the discussion by articulating individual perspectives through presentation of work.

> **Participant L:** I would be very interested to read what others have come up with for this activity. Here is my posting (**Articulation of individual posting, IV**)............

In the following one, an attempt has been made to represent the individual understanding.

> **Participant J:** I did not find this easy. Especially coming up with value and attitudes. Maybe I got it all mixed up. Can anybody give us definitions of "value" versus "attitude" with examples? Would be very helpful. (**Co-constructing shared perspectives by asking for elaboration, CA**). Here is my contribution (**Articulation of individual perspectives through the presentation of work, IV**).

Moreover, the critical analysis of the posting suggests that as the learning process is taking place within the context of social interaction, therefore an endeavour has been made to clarify the meaning of certain disputed terms.

According to the intention of collaborative interaction, the clarification of the meaning should involve a procedure of mutual negotiation where the individuals' perspectives enriched with personal experience can encounter each other, and finally could result in mutually accepted group knowledge. The intervention of the tutor can steer the discourse towards effectual collaborations; therefore as a preliminary attempt the nature of intervention should be fixed on to stimulate the participants for constructive discourse. For example,

> **Tutor:** I agree this isn't an easy activity - I think these 'areas of education' have their origins in the post war curriculum thinking of people like Bloom; Krathwohl and others who tried to design Handbooks of learning objectives for cognitive behaviours; psychomotor activities and aesthetic and emotional development .... (**Direct instruction: confirm understanding through assessment and explanatory feedback**).

Conversely from this posting, it is obvious that the direct instruction in the form of assessment might be advantageous for individuals to appreciate the meaning, but the nature of the communication could be narrowed between the tutor and the

participant only, which is practically a contradictory method of multidirectional discourse of collaborative learning.

Furthermore, from the research results of an empirical study, Laurillard (1997) commented that, each student's choice of deep or surface approach, and of operation or comprehension learning, is dependent to some extent on the nature of the problem set and to some extent on their perception of the teacher's requirements. Considering this proposition, it is quite clear that the design of the task as well as the character of the involvement of the tutor with the discussion forum (as we have already observed in the previous message) might allow to interpret the nature of learning by the participants as just the articulation of individual perspectives in a group, where the initial understanding could be judged against the authoritative knowledge of the tutor. For example,

> **Participant O:** the following is what I did in the activity: Here one of the definitions of what I consider learning to be: Learning is a process that involves acquisition of knowledge, skills, attitudes and.... (**Articulation of individual perspectives through the presentation of work, IV**).

The critical evaluation of the posting highlights that rather than engaging them in mutual negotiation of the construction of knowledge, the participants are active in each other's learning process only by providing additional examples of concepts which in essence are already understood. In terms of Gunawardena et al., (1997), this type of learning could be called 'learning by accretion', or pooling of knowledge. However, from the perspective of shared cognition (the fundamental theoretical foundation of collaborative learning), from a group perspective, explanation is not something delivered by the explainer to the explainee; it is instead constructed jointly by both partners trying to understand each other (Backer, 1991). Consequently rather than adding the new information as a possible approach to elaborating the existing idea, there is a need to discuss and comment on each others' point and to 'share', because that is what elicits those internal processes of learning happening within the individual mind.

From the following post, it is quite clear that the participant is aware of the presence of others, but does not explicitly reference their perspectives.

> **Participant M:** The Table below captures my examples of knowledge, skill, attitude, value and behaviour (**Articulation of individual perspectives through the presentation of work, IV**). I will appreciate your feedback on this (**Co-constructing shared perspective by soliciting feedback, CF**).

For the construction of collaborative knowledge, not only it is significantly important to get the feedback from others on the initial postings, but also it is necessary to criticise the perspectives of others even when there is an apparent agreement. The structure of the collaborative dialogue is expected to be complex, as there should be always a provision for argument for standpoint, justification, negotiation and a conscious attempt to convince the fellow members. Otherwise it is difficult to transform the individual interpretation into collective comprehension; the knowledge development process might be limited within the inter-individual plane, which supports the social-as-context view of collaboration. Therefore, soliciting feedback might be an attempt to involve others in the process of joint construction of knowledge; however it is important to monitor how far that initiation has been answered by others.

As proposed earlier, the procedure of co-construction can only been fruitfully accomplished if the propositions presented by others can go through a negotiation among the participating individuals.

> **Participant E:** I also had difficulty trying to decide what the difference was between an attitude and behaviour! (**Co-constructing shared perspectives and meaning by asking for clarification, CA**). This is what I came up with in an attempt to define this for myself.... (**Articulation of individual perspectives through the presentation of work, IV**).

In terms of this dialogue, there is a necessity to discuss the 'difference between an attitude and behaviours' to ascertain a common meaning. Without the iterative mode of discussion it is impossible to establish the common meaning necessary to validate the aspect of group cognition.

The following posting, can be judged as an attempt at co-constructing shared perspectives and meaning by proposing elaboration.

> **Participant J:** Wow, E, great definitions, thanks a lot. In addition to yours and C's (the tutor) thoughts on 'value', let me add that for value is linked to a shared social convention. **(Co-constructing shared perspectives and meaning by proposing elaboration, CE).**

When there is an apparent agreement among the perceptions, it is possible that the participants might be going for tacit understanding, where the negotiation is not very explicit. However to establish a deep approach to learning there is a need to attain mutual understanding through clarifying certain terms and expressions. If this mutual negotiation has not been made explicit in the dialogue, then it is rather complicated to evaluate how far each participant has skilfully analysed the previous definitions. As a consequence the elaboration could simply be an attempt at offering additional information, as opposed to establishing common ground through mutual negotiation.

The next posting clearly signifies that without significant negotiation or iteration of communication it is not possible to restructure the initial understanding of the concept.

> **Participant O:** I found the discussion that followed J's input right to the point **(Accommodating the perspectives of others, through direct agreement, PA).** However, I still have difficulties to understand the concept of value **(Co-constructing shared perspectives, by asking for clarification, CA).** Value for me means something that you do not question too much. You learn it to be a value and valid because you are told so. Instead, your attitude is constructed on the basis of your own experience. In Finnish, the word value also refers very much to the economic value of things today **(Co-constructing shared perspectives by proposing some alternative suggestions, CE).**

In fact, this above posting clearly supports the idea that sometimes it is possible that the discussion around activities can only elaborate in terms of breadth, but does not go deeper into integration or conclusion. The mere articulation of individual perspectives can only help the discussion to expand, where the specific knowledge elements could remain without further refinement. Therefore, the resolution of conflict could be completely dependent on individual capabilities, as

opposed to joint resolution by engaging the group members in the practice situation.

Although the following post by the tutor, represents the attitude of facilitation through acknowledgement of posting, still once again no conscious attempt has been made to encourage the communication among the participants as opposed to imparting expert knowledge.

> **Tutor:** A very thought provoking submission - I can see how some kinds of the more subjective (social science based) education might try to be value-neutral - but it's hard to think of education as being entirely value free? **(Facilitating discourse: encouraging, acknowledging or reinforcing student contribution and Direct instruction: confirm understanding through assessment and explanatory feedback).**

The assessment of collaborative interaction is far more different from assessing the quality of posting from the individualistic point of view. Along with the quality of individual contribution, it is necessary to monitor how the initial understanding of the participating individuals can be changed gradually with the progression of collaboration with one another, which directly specifies the richness of interactions with others for the joint construction of meaning.

As mentioned previously that it is quite impossible to demonstrate all the 18 messages presented in the overall threaded discussion. However, we can represent the summary description of the general nature of discussion by using the modified model of Murphy (2004).

Applying modified Murphy's model to Activity 2.1

Here the 18 messages in the overall threaded discussions are categorised according to the various phases of collaborative discussion defined in the modified model of Murphy.

Murphy (modified) category	No. of messages
Social presence (S)	10
Articulating individual perspectives (I)	9
Accommodating or reflecting the perspectives of others (P)	2
Co-constructing shared perspectives and meaning (C)	5

Building shared goal and purposes (B)
    Organisational level discourse
    Practice level discourse
	0
	0

Producing shared artefact (A)	0

Table 9.5: The number of messages with distinctive characteristic from the discussion in Activity 2.1

Since each message might contain several indicators, the total in Table 9.5, add up to more than 18 (the total number of messages in the threaded discussion).

The data presented in the Table 9.5 signifies the general nature of the discussion, showing that the articulation of individual perspectives has achieved the priority in the process of discussion. Although there is some evidence of co-construction of knowledge, the qualitative analysis shows that in most of the cases the process of co-construction remained as an initiation like asking for clarification or soliciting feedback. For most of the instances no obvious approach has been observed where the participants have taken the approach to establish the joint

understanding by mutually clarifying meaning which has been asked by other. Similarly, no apparent effect of feedback has been observed throughout the process. Furthermore no endeavour has been observed by the tutor to encourage others for the extensive course of negotiation for the creation of shared meaning.

As we have discussed in Chapter five Murphy's model could be used to distinguish between socio-cultural learning and collaborative learning. The shared artefact has been considered as the significant characteristic of collaborative discussions. From this summary description of the nature of the discussion, it is obvious that the absence of this ultimate product as well as the associated mechanisms of the production (evident from the categorisation of the messages in Table 9.5, depending on their characterisation) could be enough to label the learning situation as socio-cultural learning as opposed to collaborative one. The flaws in the task design (specified in the analysis of task) as well as the approach of facilitation have restricted the learning environment as a socio-cultural one instead of establishing it as an effective collaborative environment.

9.42 Activity 2.3 Analysis of Learning Arenas: Analysis of messages

The initial postings are the usual commencement by the participants to engage in mutual discourse.

> **Participant L:** Here is my attempt at this activity. Looking forward to reading everybody else's ideas.... **(Articulation of individual perspectives through the presentation of work, IV).**

> **Participant J:** Hi, all, here what I came up with for this activity....... **(Articulation of individual perspectives through the presentation of work, IV).**

The above two postings are the usual representation of individual perception through presentation of work.

As proposed in the literature review Chapter, Ryan et al., (2000) commented that tutors also need skills for nurturing online collaboration, creating an atmosphere of openness, assuring all participants that their contributions are valued and welcome, building rapport within the group to help members to explore ideas,

different perspectives and to take ownership of their learning. The following message signifies some of these characteristics of tutor's role.

> ***Tutor:** Once again, a very thorough and thoughtful set of postings **(Facilitating discourse: Encouraging, acknowledging, or reinforcing student contributions).** I once came across a book called Improving Student's Learning by Alistair Morgan - that suggested Open University students learning fell into 8 motivational categories (sometimes learning goals had multiple motivations) academic; vocational, personal and social (4) (each category could then be further divided into either intrinsically driven or extrinsically driven - to give the 8 categories 2x4) seems like some of this analysis might be further analysed using this frame - and the frame categories themselves developed further using the submissions we receive from this activity....what do you think? **(Direct instruction: Inject knowledge from diverse sources and Facilitating discourse: drawing in participants, prompting discussion).**

In practice, in this message a conscious attempt has been made by the tutor to facilitate the process of discussion. Inject knowledge from the diverse source could be beneficial addition for the further negotiation mainly for co-construction of knowledge.

Considering the context of the next posting it might be categorised as the possible response to the question posed by the tutor.

> ***Participant J:** Yes, I agree that motivation for learning is often complex and 'multiple'. It can be subdivided further and further. Challenging part would be digging into the set of unconscious motivations. **(Articulation of individual perspectives through the presentation of work, IV).**

However, before analysing its individual contribution towards cognitive attainment of the collaborative discourse, it is necessary to monitor the following thread of discussion.

> ***Tutor:** Hmm - I suppose to do that we would need to get into the realm of (social) psychology - Freud; Jung and others like them - uncovering the

sub-conscious... **(Direct instruction: confirm understanding through assessment and explanatory feedback).**

Taken into consideration the IRF model, (I, initiation, R, response and F, feedback), this posting by the tutor could symbolise the two way dialogical processes with the participant J., where I is represented by the initial tutor's message, R has been symbolised by the response provided by the participant J and F has been depicted as the feedback provided by the tutor. As no other messages could be linked with this particular thread of discussion therefore, this part of dialogues remained limited between two person's dialogue, i.e. between the tutor and the participants, where it is quite impossible to measure its specific cognitive impact on the wider audiences, i.e. on the other participants.

Until now, using the categories of Murphy's model on the continuum of collaborative interactions, we have only observed the category of articulation of individual perspectives, which could be classified as the lower level of collaborative discussion. Even in the following messages the similar characteristic are reflected. For example,

> **Participant D:** See my contribution to this assignment. It has been a good one and challenging....... **(Articulation of individual perspectives through the presentation of work, IV).** Please go through it and let's share notes/comments **(Co-constructing shared perspectives and meaning by soliciting feedback, CF).**

> **Participant O:** The following is my analysis of Learning Arenas...... **(Articulation of individual perspectives through the presentation of work, IV).**

> **Participant K:** Kindly have a look on my analysis of learning arena. Please go through it and let's share notes/comments........ **(Articulation of individual perspectives through the presentation of work, IV).**

These three postings to some extent represent the monologues where no explicit reference has been inserted from the previous posts.

Once again, it is impossible to represent all the 29 messages presented in the overall threaded discussions. Therefore, at this point it is necessary to define the general characteristic of the messages by using the extended model of Murphy.

Applying modified Murphy's model to Activity 2.3

Here the 29 messages in the overall threaded discussions are categorised according to the various phases of collaborative discussion defined in the modified model of Murphy.

Murphy (modified) category	No. of messages
Social presence (S)	19
Articulating individual perspectives (I)	13
Accommodating or reflecting the perspectives of others (P)	0
Co-constructing shared perspectives and meaning (C)	3
Building shared goal and purposes (B) Organisational level discourse Practice level discourse	0 0
Producing shared artefact (A)	0

Table 9.6: The number of messages with distinctive characteristic from the discussion in Activity 2.3

Since each message might contain several indicators, the total in Table 9.6, adds up to more than 29 (the total number of messages in the threaded discussion).

The summary description of the nature of the discussion (Table 9.6) is quite fascinating in terms of its attributes. For the same reason as before, proposed in the case of the general trend of discussion for Activity 2.1 (i.e. the total absence of messages in the category of building shared goals and purposes and as a consequence the absence of shared artefact in the learning environment), this

learning situation could be categorised as socio-cultural learning. However, most interestingly, there are no messages in the categories of accommodating or reflecting the perspectives of others, whereas there are some messages in the category of co-constructing shared perspectives.

Considering the model of collaboration by Murphy, 2004 (Chapter five), for the construction of new meaning, there is a need that initially the participants should accommodate and reflect the perspective of others. As proposed earlier, without involving the process of accommodation, the co-construction process might be restricted to initiatives like asking for clarification or soliciting feedback. For example,

> **Participant E:** Below is my first posting ((**Articulation of individual perspectives through the presentation of work, IV**). Looking forward to your comments (**Co-constructing shared perspective and meaning by soliciting feedback, CF**).

> **Participant M:** Refer to the Table below (**Articulation of individual perspectives through the presentation of work, IV**) and feel free to comment (**Co-constructing shared perspective and meaning by soliciting feedback, CF**).

> **Participant K:** Kindly have a look on my analysis of learning arena (**Articulation of individual perspectives through the presentation of work, IV**). Please go through it and let's share notes/comments (**Co-constructing shared perspective and meaning by soliciting feedback, CF**).

These three messages may be examples of initiating co-construction of meaning within a social setting. However, bearing in mind the effective approach of co-construction through mutual negotiation, there should be processes of questioning, evaluating and criticising perspectives, which should gradually allow the participants to restructure their thinking by revising their existing cognitive schema. Otherwise, this initiation might not have any productive cognitive effects on individuals, nor for the group as a whole.

However from demonstration of the above mentioned messages as well as from the data projected in the Table 9.6, it is quite obvious that the general trend of discussion is largely restricted in the category of articulation of individual perspectives, which in essence is considerably closer to the characteristic of monologues. The initiation of the co-construction has not contributed enough towards knowledge construction mainly because of the lack of any further interest to pursue the mode of negotiation with other interlocutors.

Referring back to the objective of the course as the restructuring of the concept about learning, education and development, in this Activity (2.3), there was a clear opportunity for the participants to reflect on the previous experiences of their individual contexts. However mere reflection does not guarantee higher quality mutual negotiation as it could be limited only to the articulation of individual perspectives. To achieve the intended outcome of collaborative interaction, the participants should be able to recognise the differences and similarities among their viewpoints, which further need a joint approach to produce the shared meaning of the concept. In practice, this desired outcome could be achieved in two different ways, by incorporating the specific instructions to guide the discussion towards its effective outcome or by the intervention of the tutor to initiate the challenging dialogues among the participants. However, in this instance the task design as well as the nature of the intervention was unsuccessful in challenging the participants for the mutual engagement.

9.43 Activity 2.6 Exploring Aspects of Equality in Education: Analysis of messages

The following messages can be considered as representative examples to reflect the overall mechanism of knowledge construction in this learning situation.

> **Participant L:** I found the definitions rather challenging and I will be interested to read others' thoughts on the subject. Here is my posting.............. (**Articulation of individual perspectives through the presentation of work, IV**).

> **Tutor:** Another comprehensive analysis L - However, sometimes I think working for equality is the wrong goal - as we are all so different it is inequality of treatment or 'equity of treatment' that may be more important

- the capability theorists (people like Amartya Sen; Matha Nussbaum; Ingrid Robeyns) - argue people need to be free to develop their capabilities so that they can function in a way that enables them to live a life that they have reason to value ... you might like to research the capability movement in education and development later in the course ... **(Direct instruction: confirm understanding through assessment and explanatory feedback).**

Participant A: Please see my summary below **(IV, articulation of individual perspectives through the presentation of work).** Any comments? **(Co-constructing shared perspective and meaning by soliciting feedback, CF).**

Participant J: I couldn't come up with anything new. Here my summary..... **(Articulation of individual perspectives through the presentation of work, IV).**

Participant E: Here is my Table for this exercise........... **(Articulation of individual perspectives through the presentation of work, IV).**

Here 5 messages have been selected to represent the pattern of interaction in the overall threaded discussion (the total number of messages was 10). To provide the general characteristic of the nature of discussion Murphy's model has been applied for the categorisation.

Applying modified Murphy's model to Activity 2.6

Here the 10 messages in the overall threaded discussions are categorised according to the various phases of collaborative discussion defined in the modified model of Murphy.

Murphy (modified) category	No. of messages
Social presence (S)	7
Articulating individual perspectives (I)	4
Accommodating or reflecting the perspectives of others (P)	0
Co-constructing shared perspectives and meaning (C)	1

Building shared goal and purposes (B)
  Organisational level discourse
  Practice level discourse
	0
	0

Producing shared artefact (A)	0

Table 9.7: The number of messages with distinctive characteristic from the discussion in Activity 2.6

Since each message might contain several indicators, the total in Table 9.7, adds up to more than 10 (the total number of messages in the threaded discussion).

From the summary description of the nature of the discussion (Table 9.7), it is clear that this discussion environment has been used mainly for sharing information as opposed to the development of knowledge through mutual participation. In this situation, it is quite difficult to comprehend the productivity of the interactions as any change in the cognitive system of the individuals is taking place only in their private mental processes. Interestingly, as in the previous example (Activity 2.3), no message has been categorised as 'accommodating the perspectives of others'; however one message is in the category of 'co-constructing shared perspectives and meaning'.

The sample of the discussion as well as the presentation of data in Table 9.7, are indistinguishable from the discussion pattern in the aforementioned activities (Activity 2.3), where most of the messages are in the category of 'articulation of individual perspectives' with an almost negligible number of messages in the category of 'co-constructing shared perspectives and meaning'. Clearly from this characteristic, we can say no discussion has been observed except an initiative to share information with one another and one particular example of an initiation of co-construction through soliciting feedback.

The same rationale I have applied to Activities 2.1 and 2.3 can be used here to describe the failure to achieve the productive collaborative outcome in case of Activity 2.6. First of all from the task design itself, it is apparent that there is no obvious reason (as there was no particular instruction in terms of how to collaborate for the creation of a shared meaning like an agreed report or a table to represent the group idea) or incentive for the participants to discuss. The tutor's intervention might change the dynamic of interactions; however the approach of direct instruction has constrained the negotiation among other group members and regulated the interaction between the tutor and the particular participant.

9.44 Activity 5.1 Working in more Cross-disciplinary Situations: Analysis of messages

To comprehend the general characteristic of the nature of discussion it is important to recognise the pattern of negotiation represented through the following dialogues. The indicators designed for Murphy's model are useful to recognise the attributes of postings.

> **Participant E:** Enclosed is my answer to the question; what are some of the strengths and weaknesses of the SWAp approach to health development? ....For the question two (Are there any ways you can think of now to help educators and health workers to work better together? Think about how you work within your particular subject discipline. Are you working largely inside your subject box or trying to go beyond it... The third question; what might be some of the implications and effects of breaking down subject walls and working in a more cross-

> disciplinary manner? .... **(Articulation of individual perspectives through the presentation of work, IV).**
>
> **Participant J:** E, you have said it all **(Accommodating the perspectives of others by direct agreement, PA).** Here only a few thoughts and experiences of mine... **(Articulation of individual perspectives through the presentation of work, IV).**
>
> **Tutor:** A couple of reactions. Trust is indeed key to SWAps working well - but how does this concept work and work differently at the individual and institutional levels - so is (the elimination of) corruption - see work by Francis Fukuyama 'Trust: Asocial virtue' on the former and Jacques Hallak and Muriel Poisson Ethics and corruption in education UNESCO Paris IIEP (downloadable form the web) and even more recent work by Stephen Hynneman. **(Direct instruction: confirm understanding through assessment and explanatory feedback as well as providing information from authoritative sources).**

Apart from providing feedback to the individual participants (E and J), this particular posting by the tutor has set out to introduce fresh thoughts into the discussion. However from the constructivist point of view, this additional element of knowledge should be negotiated from multiple perspectives other than just remain constrained in the method of mere question-answer attempt.

The following example is practically an attempt to elaborate the idea proposed by the tutor.

> **Participant J:** Corruption is certainly an important issue. Omnipresent in my current country of residence, where any kind of service is "enveloped". Nothing works without envelopes (filled with money). Education system is extremely morally (and virtually) corrupted - today I had a friend in tears because her 8 years old daughter was discriminated against in the class. The teacher distributed little gifts to all good students, except to the little girl, who has excellent grades as well. It turned out that all who received gifts were also attending home-lessons with the same teacher after official

school hours. .... **(Articulation of individual perspectives through the presentation of work, IV).**

Although this is the depiction of the individual understanding and experience, taking into account the context of the discussion, this post can be directly related with the previous one as an obvious response to the theme introduced by the tutor.

The next two postings evidently are not associated with the topic of the preceding thread of the discussion.

> **Participant O:** E really said it all! **(Accommodating the perspectives of others by direct agreement, PA).** Couple of additions below.... **(Articulation of individual perspectives through the presentation of work, IV).**

> **Participant M:** E, raised the key issues **(Accommodating the perspectives of others by direct agreement, PA).** Mine are just additions...... **(Articulation of individual perspectives through the presentation of work, IV).**

Consequently, the tutor's initiation (portrayed in the previous course of discussion) has stayed between him and a participant, J, which became an example of traditional question-answer method. These two postings are the articulation of individual thoughts for the Activity 5.1. Again, the discussion around Activity 5.1 was constrained as a potential approach of sharing experiences and understanding among the participants, because the initiation did not act as an attempt to negotiate perspectives for the mutual construction of knowledge.

It is not possible to present all 16 messages in the overall forum. Therefore, once again, modified Murphy's model could be used to get the impression of the general characteristic of the nature of discourse.

Applying modified Murphy's model to Activity 5.1

Here the 16 messages in the overall threaded discussions are categorised according to the various phases of collaborative discussion defined in the modified model of Murphy.

Murphy (modified) category	No. of messages
Social presence (S)	9
Articulating individual perspectives (I)	6
Accommodating or reflecting the perspectives of others (P)	5
Co-constructing shared perspectives and meaning (C)	0
Building shared goal and purposes (B)	
Organisational level discourse	0
Practice level discourse	0
Producing shared artefact (A)	0

Table 9.8: The number of messages with distinctive characteristic from the discussion in Activity 5.1

Since each message might contain several indicators, the total in Table 9.8, adds up to more than 16 (the total number of messages in the threaded discussion).

From this summary description of the nature of discussion (represented in Table 9.8), it is clear that not only there is no evidence of formalising the group understanding through a shared artefact, but also none of messages are in the category of co-constructing shared perspectives or meaning. Consequently, it is difficult to achieve the true effect of collaboration in this sort of learning situation.

It is also clear from the Table 9.8 that the cognitive activities associated in this discussion forum remained limited to the lower level activities like articulation of individual perspectives and accommodating the perspectives of others. From the qualitative representation of the messages it is also clear that the 5 messages

which I have categorised as 'accommodating the perspectives of others' are the direct agreement statement. In the rest of the messages no conflict or disagreement has been observed. As a result once again the discussion forum has been used for sharing the informations with each other. By this process there is the possibility to develop knowledge within individual; however it will not succeed in producing collaborative knowledge due to lack of negotiation.

9.5 A critique of the outcome of the analysis of the threaded discussions in Case Study three

After analyzing all the threaded discussions around various activities, it might be concluded that none of these discussions represent collaborative interactions. I have argued that the term collaboration cannot be defined merely as an attempt to learn together in the practice environment. The concern is if we were to consider this definition as satisfactory, then it would be quite problematic to differentiate between the two very close approaches of learning, i.e. social-cultural learning (the example could be the mere discussion based learning) and collaborative learning. As a consequence, we would lose the opportunity to focus on an important form of learning activity, i.e. collaborative learning activity.

When we consider the learning effects of general interactions, we incorporate the idea of socio-cultural learning, as in this process the learners can construct their own learning, which could be influenced by the perspectives of others. In practice this learning mechanism could have greater learning impact on individual cognition as opposed to the mere absorption of information through the approach of instructionism. This learning approach, which we count as learning, is based on socio-constructivist principle. The learners do get the opportunity to reflect on their own experience, therefore they can analyse their context against the generally accepted theoretical proposition of the concept, which could help them to synthesize a new understanding of the meaning. In fact, they can constantly analyse the information perceived through others, and assess that information against local knowledge, especially in the light of their own experience. Therefore, the discussions might provide greater authentic experience, compared to the mere considerations of abstract concepts. Alternatively, it can provide a

wide opportunity for the learners to comprehend the core conceptual idea against different practical contexts. Therefore this learning process might help the learners to be critically engaged with the subject matter, which might result in the development of a new understanding.

In reality, we have observed evidence in the threaded discussions where some of the individual postings truly reflected the theoretical propositions of social constructivism, where the participants' postings provided evidence of the gradual transition from lower order processes to the relatively higher order, by accommodating the perspectives of others and attempting to formalise the co-construction by the skilful analysis of the perceived information (the number of messages in the different categories of Murphy's model presented in the tables 9.5, 9.6, 9.7 and 9.8 supports this assumption).

However, there are some problematic characteristics in this kind of learning. First, the development of these kinds of higher order activities like critical analysis of the subject, or the formulation of synthesised understanding, cannot be easily attained by all individuals present in a group. It is difficult to cultivate these categories of mental skills for everybody who takes part in this type of interaction. As a result, the productivity of the interactions might be ambiguous, as only some of the participants may understand what the others are saying, which means their analysis could be much more peripheral, as opposed to the deep understanding of the meaning. Even if the participants are deeply influenced by the proposition presented by others, it is quite possible that the subsequent processes of analysis, synthesis or evaluation might take place outside the learning environment. Therefore, this socio-cultural learning may be used just to provide impetus to restructure the existing cognitive system by considering the perspectives presented by others, and there is no such specific need to finalise the understanding within the practice environment. Alternatively, as nothing is shared in this approach, the participants can take away as much or as little depending on their own initiation to develop knowledge through interactions.

Therefore, the socio-cultural learning environment could have only some fragmented or isolated evidence of knowledge constructions by certain individuals (which might be observed as the individual utterances, indicating the revised understanding of the concept) as in most of the cases the cognitive processes could be concealed within the thinker's private way of thinking.

However, when we are considering the aspect of mutual interdependencies in the learning process of joint construction of knowledge, then the learning mechanism should automatically be shifted from the inter-individual plane to shared cognition.

Therefore to make a gradual transition from the interaction in a minimal sense to the interaction for the intersubjective learning, there should be another significant shift from the concept of socio-cultural learning to collaborative learning. And most importantly, there is a need to analyse the situations in order to understand what motivates the learners to go further in their attempt to gain mutual understanding as opposed to just learning to understand each other.

For example, the task design of all the activities in this Case Study does not provide enough impetus for the participants to help them towards attaining mutual understanding. The task design with its associated goals can determine the extent to which the learners will be willing to expand efforts in achieving mutual understanding. The instructional guidance in the form of an external script (embedded in the task design) can assist the participants to conceptualise the significance of involvement in the collaborative situations. Furthermore, these instructions can be helpful for the participants to recall the skills of collaboration experienced in the previous learning situations (in the form of internal script). Therefore the task design with the associated instructional guidance could have a profound impact on students achieving the intended consequence of collaborative interactions.

It is true that there is the possibility that the establishment of the shared objective can be included in the task by the strategic moderation of the online discourse, which might be categorised as the compensation for the well-defined task design.

However, in this case the involvement or the nature of the moderating strategy of the tutor can easily be categorised as direct instruction as opposed to facilitation, as the overall approach was confined to ensuring individual attainment. The direct instruction in the form of immediate feedback to the individual posting to the participant can support the hierarchical view of knowledge and authority to some extent. The acknowledgement of an individual posting can provide the positive motivation for the participants; even the introduction of some authentic resources might be helpful to expand the knowledge base; however the immediate

evaluation of the content of the individual post might restrict the opportunity for the further negotiation. As depicted by Scardamalia and Bereiter (2006), we do not want students to meekly accept authoritative pronouncements. In the current situation, 'because I say so' and 'because the book says so' are no longer regarded as acceptable responses to students' skeptical queries. Here the concept of 'knowledge of' (or knowing how) is far more essential than the concept of 'knowledge about' (or knowing that). 'Knowledge of' is activated when a need for it is encountered in action. Whereas 'knowledge about' is approximately equivalent to declarative knowledge, 'knowledge of' is a much richer concept than procedural knowledge (Scardamalia and Bereiter, 2006). Therefore under any circumstance where there is any apparent conflict among the participants, or in an apparently agreed situation there should be wider scope for negotiation among the participants. This negotiation can provide the scope to construct a relation between the abstract concept and the experience of the learners to make it more authentic as the learning environment can favour increasingly deep inquiry into questions of how and why rather than the shallower kinds of inquiry guided by questions of what and when (Scardamalia and Bereiter, 2006).

In practice, the assessment of individual understanding could be one of the fundamental focuses for moderation of any productive discourse, as at the same time it is important to monitor the process through which this new understanding is likely to emerge. For example, if it is expected that the development of new understanding would be the result of the collective effort of the negotiating groups, then it is worthwhile to supervise the group understanding as a whole.

In practice 'knowledge about' is often the preferred indicator of academic achievement, therefore even in the discussion forum the attentions have been paid in the process of information sharing with one another. Probably, for that we would need to get rid of the traditional autocracy, and then we would be able to recognise the process of knowledge development as the collective actions of several individuals.

Again, it is important to consider the tutor's individual view about collaborative interactions to be able to discern a relation between the perception and practice.

9.6 Analysis of the interview data

In this analysis, I will represent the essential information which I acquired in the course of the semi structured interview with the tutor. These questions are unambiguously associated with the methodology of facilitating the group discourse to attain the purported outcome of collaborative discussions.

1. According to your perception what is collaborative learning?

> **Response:** Collaborative learning can either be a group of scholars' trendy niche or simply an umbrella of different kinds of interaction, communication, development and/or intellectual sharing and stimulation between students.

From what we have observed of the other responses about collaborative learning, this response is not radically distinct from them. The concept of collaborative learning has been considered once again as something which is very much similar to the conventional approach of socio-cultural learning. Or in other words, the collaborative learning has been conceptualised as social-as-context to stimulate the restructuring the individual cognitive system.

2. Do you expect any distinctive learning outcome from the collaborative approach?

> **Response:** Our course is driven by constructivist approach of learning. Therefore, we can expect that during collaboration the participants will construct knowledge from each other's experience, local knowledge etc.

This response cannot justify the learning outcome of collaborative interactions as far as the group knowledge development is concerned. Still the expectation of learning outcomes is very much limited in the individual epistemology, it has not been extended to the group level, which is very obvious even from the analysis of the threaded discussions.

3. What are the conditions (or factors) you have to take into your consideration to make collaborative learning successful?

> **Response:** To make the collaborative learning successful you have to make sure that it should be a part of a fruitful experience and an ongoing developmental process. One should work and constantly try to enable and facilitate their students and/or their own development by employing everything that is available that could assist this ongoing process.

The fruitful and ongoing developmental process can be achieved from two different perspectives. If the objective of the using discussion is the exposure to the diverse points of view of different participating individuals, then that objective could be achieved by motivating the members to articulate their individual perspectives, which we generally observed in the threaded discussion. Moreover, the immediate feedback by the tutors can be beneficial for the extension of existing knowledge base of the individuals. However as far as the collaborative interactions are concerned, the developmental process should be targeted towards the group development through mutual negotiation, where the interactional process itself would be the indicator of group knowledge development.

4. In terms of your perspective what would be the tutor's role in the effective collaborative discussion?

> **Response:** The tutor's prime role would be design the task closely associated with the experience of the participants to provide the authentic feelings. Moreover, intervention could be one of the most important roles of the tutor. By intervening into the discussion, we can make sure the knowledge construction is fostered and supported, and most importantly we can judge how far the participants are building confidence, independent judgement and critical learning skills. Finally I can say, the tutor has a responsibility to ensure that the aims and outcome of the course being achieved.

As the aims and the expected outcome of the course are based mainly on the intention of the individual knowledge construction, as a result the tutor's role has been conceptualised as a means of scaffolding to the individual knowledge construction.

5. How can you ensure the maximum participation in the collaborative discussion?

> **Response:** The online participation should be considered from the qualitative point of view, not from the quantitative perspective. Some participants might not contribute towards the collective knowledge but can learn a lot in their individual level. In our course, we have a minimum requirement of participation. If they have failed to do that, they would be marked down for the course. The participation can be increased by task design and sensitive tutoring.

This kind of conceptualisation of collaborative learning is absolutely against its intended attributes. The principal feature of collaborative learning requires interdependencies in the learning process, where the group members have to invent knowledge jointly, which cannot be attained by the individual effort.

9.7 Conclusion

In conclusion, by analysing the internal relationship between the three major considerations: task design, the nature of discourse, and the tutor's role governed by his own interpretation of the term 'collaboration', the general findings of Case Study three can be represented in a tabular representation (Table 9.9).

Factors	Case Study one
Tutor's perception of collaboration	Limits collaboration to discussion
Nature of task design	Not explicit about collaboration
Tutor's role	Provides information about the subject matter, facilitates the process of the IRF model
Low level messages	84
High level messages	9

Table 9.9: Summary of the findings of Case Study three

Since each message might contain several indicators, the total in Table 9.9 adds up to more than 73 (the total number of messages in the threaded discussions of Activity 2.1; Activity 2.3; Activity 2.6; and Activity 5.1).

The number of low level messages is the sum of all the messages, across all the activities in Case Study one, that are categorised as: 'social presence' (S) + 'articulation of individual perspectives' (I) + 'accommodating or reflecting the perspectives of others' (P).

The number of high level messages is the sum of all the messages, across all the activities in Case Study one, categorised as 'co-constructing shared perspectives and meaning' (C) + 'building shared goal and purposes' (B) + 'producing shared artefact' (A).

From this tabular representation (Table 9.9), it is quite clear that,

- The notion of teaching and learning is still being considered as activities of individual minds; it is really hard for tutors to conceive of them as primarily group activities.

- The inclination towards the assessment of individual cognition is very much obvious in the messages posted by the tutor. This act supports the fact that the term 'collaboration' has been conceptualised by the tutor as a mere effort that can be used for the introduction of the information to bring certain changes in the current understanding of the participant as opposed to the overall change

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in the group cognition by mutual negotiation. As an obvious consequence, the facilitation approach has also remained controlled either by introducing new ideas or in the process of the IRF (initiation-response-feedback) model between the individual participant and the tutor as opposed involving the whole group for further negotiation.

- Furthermore, this interpretation accounts for the inadequate guideline in the task design. No precaution was taken to structure the activities in such a way (like offering the guideline in terms of structuring the groups, possible approach of interaction or clear formulation of the aim) that could provide the additional help to the participants, or provide the external support to their internal script to help them comprehend their role and the method of collaboration.

- As a consequence the interaction among the participants remained very much constrained within the preliminary phases of collaborative interactions (in terms of Murphy's modified model), where no further communication has taken place to achieve the shared artefact through the subsequent phases of organisational and practice level discussion under the category of 'building shared goals and purposes'.

Finally we can say, supporting the statement by Dillenbourg (1999), that the term 'collaboration' has become a fashionable expression, and the tutors are over-using this term almost everywhere without thinking about what will be the immediate expectations from this kind of learning environment. Until and unless a tangible outcome of collaborative interactions is envisioned as an essential part of the learning situation, it is impossible to label that interactional space as a collaborative one. From that perspective, the discussion spaces of Case Study three under four different activities cannot be described as providing a collaborative learning environment.

Chapter ten: Case Study four

10.1 Case Study four

This Chapter will represent Case Study four, which will include the presentation of the threaded discussions along with their subsequent interpretations. The focus will be on identifying the existence of a collaborative learning mechanism in the learning situation. As conditional effects of collaborative learning, the task designs and the perceptions of the tutor will also be scrutinized critically as having an immediate impact on the success of collaborative interactions.

10.2 Brief introduction of the Case: Cryptography and Security Management.

This is the 'Cryptography and Security Management' module from a course for M.Sc in Information Security. The particular focus is on cryptography and security mechanisms. Pitched at just the right level for non-maths graduates, the objective of the course is to explain the roles of all the major cryptographic primitives, including symmetric key cryptography (block and stream ciphers), hashes, message authentication codes, asymmetric (public) key cryptography and digital signatures. The module is offered as a distance learning course, using Moodle – the virtual learning environment.

Activities	No of participants	Duration	No of tutor	No of messages in the overall thread
Activity 2.1	6	11-20 Jan, 2009	2	30
Activity 2.2	4	15-24 Jan, 2009	2	24
Activity 4.2	6	21-31Jan, 2009	2	10
Activity 4.3	7	27th Jan to 6th Feb, 2009	2	18

Table 10.1: the general overview of the course

The data and analysis of this case is described in the following sections.

10.3 Task design

Before analyzing the learning environment to measure its effectiveness as a collaborative environment, it is important to analyse the general trend of task design. These were designed by the tutor as follows:

Activity 2.1: Data origin authentication

Task: We have already seen that a MAC provides two cryptographic services: data origin authentication and data integrity. Two questions: 1) Explain in your own words what these cryptographic services actually mean. 2) Is there a relationship between both services? E.g. does data integrity imply data origin authentication?

Activity 2.2: MAC key lengths

Let us now consider whether MAC keys should be shorter (or longer) (or just the same length) as encryption keys when the two are used in the same application. What are your views on this?

Activity 4.2: MAC length

There are more arguments to flush out on proprietary encryption - so please keep discussing that. Let's also look at the next recommendation on MAC lengths. 1 - What would be the case for a **long** MAC length? 2 - What would be the case for a short MAC length?

Activity 4.3: MAC versus hash functions

Please explain the practical difference between MACs and hash functions. By "practical" I mean that you don't have to go into a detailed technical explanation of the various properties of each. I just want to know the different situations in which you would deploy them and what security services you would get from them.

10.31 The analysis of task design

For the critical analysis of the task design, it is necessary to reflect on certain propositions highlighted in the literature, especially in Chapter six, under the category of 'task design characteristics'.

As proposed earlier, the positive interdependency among the participants in the process of developing knowledge is the crucial factor for achieving the effective outcome of collaborative interactions. And possibly these interdependencies can be inserted in the overall task design of the course,

- By structuring the task in such a way that can lead the discussion for the production of a shared artefact, may be the joint interpretation of the concept under study.

- The interpretation of the task design by the group members should assist them to realise that the contribution of each individual should be counted for the success of the team work. Alternatively, one cannot succeed unless all members succeed; more precisely they either sink or swim together (Johnson et al., 1998).

Nevertheless, this primary concern has not been revealed in the above mentioned activities. Especially from their general structure,

- It is difficult to deduce whether the activities are meant for collaboration, or are designed for individual assessment.

- As observed in the Case Study one, here also the introduction of the topics is the only evidence of structuring the activities.

- Moreover, there is no evidence of any specific instruction that would be necessary for developing the collaborating group.

- There is not even any particular guideline in terms of how the participants should interact and collaborate.

- Consequently, no external support for the participants to revive their previous experience of collaborative learning, in the form of 'internal script'.

However as before, in this case also attention should be paid to exploring if in the learning environment any special measure has been taken by the tutor to compensate the structural inefficiency of the task design.

The following sections analyse the messages relating to these four activities, and the outcomes they achieved.

10.4 The identification of the nature of collaboration in the threaded discussions

As before, in the process of analysis, modified Murphy's model was used to identify the existence of the six consecutive steps of collaboration in the threaded discussions in order to test the extent to which the discussion meets the criteria for being collaborative. Here, each message as a unit of analysis has been identified (the specific indicators under all major categories has used for identification of the nature of the message; the detailed description has been provided in Chapter five), and categorised according to the six different phases of the collaborative process. Throughout all the activities the messages are presented in sequential order.

10.41 Activity 2.1 Data origin authentication 1: Analysis of messages

Like all other previous cases, authors of postings are identified by initials only. Similarly, specific indicators have been used to express the characteristic of the

messages, for example as proposed in Chapter five, the symbolic representation of IV represents the categorisation as 'articulating individual perspectives'; PA, 'accommodating the perspectives of others'; CA, 'co-constructing shared perspectives' etc. In each case the quote is categorised and then interpreted for its pedagogical significance in relation to the theory.

Typically, the tutor's role should be measured by using a model proposed by Anderson et al., 2001, by categorising the messages posted by the tutor into three major categories: 'Design and organisation'; 'Facilitating discourse' and 'Direct instruction'. The detailed description of this model has been presented in Chapter five.

It is not possible to represent all of the 30 messages in this section. Consequently, the messages are selected mainly to represent the cognitive dimensions of collaborative interactions.

As this is the first post in the discussion forum it should be classified as the articulation of individual perspectives.

> **Participant S:** 1. I am thinking about the difference between non-repudiation and data origin authentication. Is it correct to say that if there are only two people who know the key, sender and receiver... However, if the receiver wants to prove this at court, it doesn't work because he may have sent the message to himself (thus no non-repudiation). Could data origin authentication be seen as a kind of "poor man's non-repudiation" just internally between sender and receiver??? **(Co-constructing shared perspectives by asking for clarification, CA).**
>
> Data integrity should be straight forward: the receiver trusts in the message not being changed on its way from sender to him, if the test of applying the key to the message creates the same MAC value as sent by the sender. 2) In my opinion data integrity could imply.... Does that make sense? **(Articulating individual perspectives, IV).**

However, as the participant is conscious about the presence of other members of the group and the tutor, he has initiated one precise question (an initiation for the co-construction of meaning), which might be critical for his enhanced understanding of the concept.

The analysis of the next post by the tutor is significantly important as it could explicate the role of the tutor to achieve the desired outcome of collaborative learning.

> **Tutor:** I would hesitate to call DOA "poor man's non-repudiation", but I know what you mean. Non-repudiation definitely asks for a bit more. However there are many applications... I don't agree with your second point. Symmetric encryption in general does not offer data integrity. Can you give me an example why not? **(Direct instruction: confirm understanding through assessment and explanatory feedback).**

As we have observed in the aforementioned illustration of threaded discussion in Case Study three, here once again the tutor's intervention is much more fixed on direct instruction as opposed to facilitation. In this example this question can be used for the other participants (like the tutor could invite the other participants) where they have the opportunity to discuss the issue from the multiple perspectives. In fact, if the question remained closed between the tutor and participant, it could be another example of mere question-answer technique.

Although from the feature of the next posting, it can easily be categorised as the articulation of individual perspectives, still taking into account the context of the dialogue it might be characterised as the potential approach of responding to the question presented by the tutor.

> **Participant S:** Yes, the second point should say symmetric encryption together with a MAC algorithm. Symmetric encryption (alone) in general does not offer data integrity because an interceptor could take out parts of the encrypted message without notice of the recipient of the message (e.g. with stream ciphers) **(Articulating individual perspectives, IV).**

From this message it is evident that even this sort of learning mechanism (like the mere question-answer technique) can end in the co-construction of knowledge; however the process of co-construction could remain between the tutor and the participants, as opposed to connecting other members in the process.

In the following posting there is no particular mention of the threaded discussion which has taken place between the tutor and the participant S. In practice this is a typical example of monologue where the individual interpretation of the concept

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has been portrayed through the articulation of individual perspective without making any reference to the perspectives of others.

> **Participant R:** As I understand so far data integrity can be stated as a property of data that has not been altered in an unauthorized manner from the time of its creation, transmission, or storage by an authorized source.................in the past, of which data integrity is a subset. Thus data origin authentication includes data integrity **(Articulation of individual perspectives, IV).**

In the following example, the message can be easily categorised as the articulation of individual perspectives, however implicitly the participant D did make reference to the same topic, therefore there is an essence of accommodating the perspectives of others and co-constructing shared perspectives through the elaboration of the concept presented by R, perhaps to provide clarification or to insist on a more precise definition.

> **Participant D**: Data Integrity validates that data has not changed in transmission from sender to receiver... Data integrity does not imply data origin, but they are related. Data origin authentication provides the next step beyond integrity, by validating not only that the data has not changed, but confirms its source as well **(Articulation of individual perspectives, IV).**

However, it is interesting that there is no explicit disagreement, or comment at the meta-level, so D is not inviting a collaborative approach, but trying to improve on the previous statement.

The following post by the tutor, represents the direct instruction by confirming understanding through assessment and explanatory feedback, however no conscious attempt has been made to encourage the communication among the participants as opposed to imparting expert knowledge.

> **Tutor:** In other words, from your points... data origin authentication implies data integrity...I agree..... ? **(Direct instruction: confirm understanding through assessment and explanatory feedback).**

As we have seen in the examples of the other Case Studies, the direct instruction might be beneficial for the restructuring of the individual cognitive system as it can provide the impetus to change the initial understanding of the subject matter. However, in the context of collaborative learning, along with the restructuring of the individual cognitive system, it is essential to bring the change in the group cognition, which can only be obtained by changing the initial interpretation of concept of all the participating group members. Collaborative learning is not all about the individual achievement; it is about the achievement in the group level. Therefore the assessment at the personal level can cause hindrance in the creation of knowledge at the group level. At any point it is desirable to facilitate the communication among the group members for the assessment of general improvement in the understanding of all the members present in the collaborative group.

As mentioned earlier, from the practical point of view, it is impossible to represent all the 30 messages in the overall discussion forum. Therefore, till this point I have provided the examples of the messages in a sequential manner (excluding the messages which are predominantly meant for mere social chat), however the rest of the examples are random selection of the postings to justify the general trend of discussion around the Activity 2.1.

For example, the next posting once again reconfirms the fact that the articulation of individual perspectives is the most dominating characteristic of the nature of communication.

> **Participant R:** Message integrity means that the data is whole or complete. In other words the condition of the data received is identically (the same) maintained as sent by the sender. There is assurance that the data is consistent and correct. Data is protected from modification..........
> Thus, cryptographic services do not provide a good solution for integrity as it is difficult for the receiver to identify legitimate data **(Articulation of individual perspectives, IV).**

This posting by the tutor once again confirms the assumption that the tutor is much more interested in the assessment of individual understanding as opposed to considering the achievement of the group as a whole.

Tutor: I agree with almost everything you wrote except the last statement. MACs, which we are discussing here, are cryptographic mechanisms that provide data origin authentication (and hence by definition also data integrity). Thus I would claim that cryptography is a very good place to look for a data integrity mechanism. **(Direct instruction: confirm understanding through assessment and explanatory feedback).**

Now at this point, we can use the modified Murphy's model to demonstrate the overall learning mechanism happened inside the practice situation in the name of collaborative learning.

Applying modified Murphy's model to Activity 2.1

Murphy (modified) category	No. of messages
Social presence (S)	13
Articulating individual perspectives (I)	14
Accommodating or reflecting the perspectives of others (P)	2
Co-constructing shared perspectives and meaning (C)	4
Building shared goal and purposes (B)	
Organisational level discourse	0
Practice level discourse	0
Producing shared artefact (A)	0

Table 10.2: The number of messages with distinctive characteristic from the discussion in Activity 2.1

Since each message might contain several indicators, the total in Table 10.2, add up to more than 30 (the total number of messages in the threaded discussion).

The data presented in Table 10.2 reinforces the fact that the learning environment can be characterised as socio-cultural learning, but it is also considerably dominated by the approach of articulation of individual perspective.

From the overall nature of the discourse, it is seems that the entire purpose of the discussion was for the tutor to assess the individual understanding of the concept. Therefore, the responses did not move forward along the continuum of collaborative processes. The majority of the messages are the evidence of

articulation of individual perspectives, which indeed look like the monologue in the discussion forum.

10.42 Activity 2.2 MAC key lengths: Analysis of messages

The initial posting is the beginning of this discussion forum with the articulation of individual perspectives.

> **Participant R:** If the MAC key is shorter an opponent could keep searching for keys and restart the key search machine every time a new text-MAC pair is observed........ **(Articulation of individual perspectives, IV).**

As I have said earlier, if the concept of shared goal has not been included in the task design, the tutor can strategically introduce that objective during the course of discussion. Therefore, it is crucial to analyse the following posting of the tutor to decide how far that objective has been reflected in his message.

> **Tutor:** You raise a really interesting point in your comment, R. I wonder what others think: Is it better to: 1 - encrypt a message and then compute a MAC on the cipher text (encrypt then authenticate) or 2 - compute a MAC on the message and then encrypt the message only or 3 - compute a MAC on the message and then encrypt the message and the MAC. Thoughts? **(Facilitating discourse: drawing in participants, prompting discussion).**

It is true that the above mentioned posting by the tutor can encourage the participants to discuss the subject matter from the individual point of view and then it could be mutually negotiated for the creation of joint understanding. However this initiation can only be transformed into a productive outcome if the participants are eager to be involved in the critical analysis of their individual perspectives as opposed to just articulation of their views on the topic.

The following post is the usual representation of the articulation of individual perspectives, or we can say this is the simple attempt to respond to the question introduced by the tutor.

> **Participant A:** The MAC function/algorithm provides origin of data authentication and data integrity validation. These reinforce the encryption process as any attempt on manipulating the encrypted data will be highlighted when the destination/receiver calculates and... I would go for option 1 **(Articulation of individual perspectives, IV).**

However as projected in case of discussion around Activity 2.1; there is the possibility that this sort of articulation of the individual perspective can be considered as the elaboration of the concept, which could be an integral part of co-construction of shared understanding. However, the concept of co-construction is the validation of meaning from the shared point of view. Therefore, any new idea cannot be just accepted without any further negotiation. It is possible that there could not be any disagreement however even within an apparently agreed situation; the participating individuals should provide the justification in terms of how it is related to their existing beliefs.

The following example is the true representation of facilitation by the tutor in the collaborative setting.

> **Tutor:** Your argument in favour of EtA (Encrypt-then-Authenticate) is certainly valid. By having a recipient of the message verify the MAC first, he will detect bogus messages without having to decrypt them. **(Direct instruction: confirm understanding through assessment and explanatory feedback).** Other arguments in favour or against EtA? **(Facilitating discourse: drawing in participants, prompting discussion).**

Considering the complexity of the subject matter, it might be necessary for the tutors to confirm understanding through assessment and explanatory feedback. Moreover, there is an attempt to involve other participants in the ongoing discussion, which could be considered as one of the positive features of facilitation. However, the effectiveness of this kind of intervention can only be achieved if there is a follow up strategy by the tutor to make sure that the participants do really involve in the course of discussion.

The next two postings are interpretations of the terms purely based on individual experience/knowledge.

Participant R: Applying EtA method is better provided that the encryption function is semantically secure (plaintext indistinguishable) under a chosen plaintext attack and the authentication function is a MAC that resists chosen message attacks. **(Articulation of individual perspectives, IV).**

Participant D: I would say that another advantage of EtA is that there can be a neat separation between message authentication and decryption. In a complex system different entities could have the responsibility of authentication. **(Articulation of individual perspectives, IV).**

Once more it could be said that these two postings are the usual commencement to extend the knowledge base through elaboration of the concept. However if there is no evidence that how far these new informations has been accepted by others (which should be reflected through the messages indicating the existence of the cognitive process like accommodating the perspectives of others), it is impossible to gauge their impact on the restructuring of the cognitive systems of the other participating individuals.

At this point, to portray the characteristics of other messages, modified Murphy's model can be used to categorise all the messages present in the discussion forum.

Applying modified Murphy's model to Activity 2.2

Murphy (modified) category	No. of messages
Social presence (S)	11
Articulating individual perspectives (I)	16
Accommodating or reflecting the perspectives of others (P)	0
Co-constructing shared perspectives and meaning (C)	1
Building shared goal and purposes (B)	
Organisational level discourse	0
Practice level discourse	0
Producing shared artefact (A)	1

Table 10.3: The number of messages with distinctive characteristics from the discussion in Activity 2.2

Since each message might contain several indicators, the total in Table 10.3, adds up to more than 24 (the total number of messages in the threaded discussion).

From the summary description of the nature of the discussion (Table 10.3), it is apparent that although there is the existence of an artefact in the learning environment, still the categorisation of the messages clearly demonstrates the fact that the formation of the artefact is the simple representation of individual understanding. In practice the total absence of the messages in the category of organisational as well as the practice level discussion reconfirms this initial

assumption; however from the qualitative point of view it is important to analyse the associated process to create the artefact.

> **Tutor:** Can anyone provide a nice summary of the good arguments that have been made for the order of these operations? **(Direct instruction: An attempt to summarise the discussion).**

As we have observed in Case Study one, this posting might be categorised as an attempt to formalise the understanding of the group in the form of a summary to act as the tangible outcome of discussion.

The following posting is the most obvious reply to the above initiation and this one is the most interesting in terms of its characteristic.

> **Participant R:** Arguments in favour of Encrypt-then-Authenticate: 1) EtA is more efficient in discarding bogus messages (messages with a wrong MAC). The recipient only has to verify the MAC, and does not have to decrypt the message anymore if the MAC verification failed. This argument is relevant if a recipient receives lots of bogus messages, such as in case of a Denial of Service (DoS) attack. 2) Research has shown that EtA is secure in general, while AtE is not always secure. The research has been performed by Hugo Krawczyk.

> Arguments in favour of Authenticate-then-Encrypt: 1) AtE hides the input for the MAC and the actual MAC value from an adversary. This makes it harder to attack the MAC function. 2) In case of AtE you MAC the plaintext, and not the cipher text. So you know what you MAC. 3) Argument (2) in favour of EtA states that AtE is not secure in general. However, AtE is actually secure in case CBC-mode encryption is used, or in case XOR-based stream ciphers are used.

> Conclusion: which option is better? **(Development of a shared artefact, AD).**

As before, in the name of summary only the information has been compiled together, which certainly cannot be counted as the representation of group understanding. In the end the sentence itself 'which option is better', explicitly

signifies that for the evaluation of information, it is not adequate to understand what others are saying, it is important to analyse the information critically to find out their specific attributes necessary for addressing the contextual needs. Or in other words it is always desirable to establish the common ground through the process of inter subjective meaning making.

However the absence of any further message presented by the tutor as well as by the other participants has restricted the scope to attain the collaborative knowledge through mutual discourse.

10.43 Activity 4.2 MAC length: Analysis of messages

The initial post is typical in representing the commencement of the discussion forum.

> **Participant S:** The longer the MAC, the less collisions we should get, because when we create a string out of a (longer) message there is always the possibility of a collision (creation of the same MAC from different input text)... **(Articulation of individual perspectives, IV).**

In the following posting a sincere attempt has been made to comprehend the perspectives of others.

> **Participant R:** Stefan's statements make sense, **(Accommodating the perspectives of others, direct agreement, PA)** however a little confused here: doesn't both the key and the MAC have a length proportional to $|M|$; thus $|k| = |M|$ cannot be circumvented? (Where M = message and k =key) **(Co-constructing shared perspectives and meaning by asking for clarification, CA).**

Moreover, from the second part of the message, it is quite obvious that the participant not only accommodated the perspectives of others, but also analytically evaluated them for the better understanding of the meaning. As a consequence the cognitive efforts have been categorised as co-constructing shared perspectives and meaning by asking for further clarification of the topic.

This next one posted by the tutor could be the representative of authoritative dialogue.

Tutor: No - the key and the MAC have fixed length, independent of the message length. **(Direct instruction: confirm understanding through assessment and explanatory feedback).**

It is true that there is a necessity to diagnose the understanding of the topic by the individuals, however the initiation of cognitive mechanisms like 'asking for clarification' might result in group understanding if the other members could have the opportunity to discuss the subject matter from multiple points of view. Therefore rather than confirm understanding through direct assessment of individual, it is desirable to support the interactions among others so that the process of clarification of meaning can be resulted in mutual understanding of the group as a whole. Otherwise, as proposed earlier, the authoritative feedback by the tutor can restrict the mutual negotiation among the participants. For example, in the following three postings, no attempt has been made to explore the question, introduced by participant R.

Participant W: Choosing the MAC length mainly depends on the statistical evaluation of MAC collisions. We have to choose a MAC length that makes it statistically unrealistic that a MAC collision would occur. The main factor that drives this analysis is the number of messages that we have to deal with... **(Articulation of individual perspectives, IV).**

Participant S: Apart from what the others have said **(PA, accommodating the perspectives of others by direct agreement)** the length of a MAC should depend on the value of the data and it impacts speed, computational resources and security. Long MAC length means decreasing the probability of collision occurrences.... **(Co-constructing shared perspectives, by proposing elaboration, CE).**

Participant A: The length of the MAC has direct proportion with the number of trials that an adversary does until the message to be accepted. Therefore longer MACs decrease the risk of message forgery. But, on the other hand, longer MACs give an overhead for calculation and message processing speed. **(Articulation of individual perspectives, IV).**

In practice, these are the general attempts to articulate the individual understanding required to answer the Activity 4.2. Therefore, there is no significant gradual shift in the individual understanding along the six phases of

collaborative discussion. As the cognitive approach is very much confined in the lower level, it is practically impossible to achieve the joint understanding by group cohesion.

These messages are selected predominantly on the basis of representing the cognitive mechanisms involved in the so called 'collaborative' environment. Among the 10 messages presented throughout the discussion forum only 6 have been represented here. The other four messages are similar examples of articulation of individual perspectives and the comment made by the tutor to confirm the understanding of the individual. We can visualise the general trend of discussion by applying modified Murphy's model across all the messages present in the discussion forum.

Applying modified Murphy's model to Activity 4.2

Murphy (modified) category	No. of messages
Social presence (S)	5
Articulating individual perspectives (I)	7
Accommodating or reflecting the perspectives of others (P)	1
Co-constructing shared perspectives and meaning (C)	1
Building shared goal and purposes (B) Organisational level discourse Practice level discourse	0 0
Producing shared artefact (A)	0

Table 10.4: The number of messages with distinctive characteristics from the discussion in Activity 4.2

Since each message might contain several indicators, the total in Table 10.4, adds up to more than 10 (the total number of messages in the threaded discussion).

In practice the qualitative analysis of the messages truly supports the fact (depicted in the Table 10.4), that the discussion forum has been used mainly for the articulation of several perspectives of individuals. It is quite possible that the multiple perspectives presented in the learning situation could be resulted in the advancement of knowledge, however the mechanism of knowledge construction would be restricted within the individual epistemology, and it cannot provide sufficient impetus for the group cognition.

10.44 Activity 4.3 MAC versus hash function: Analysis of messages

The first posting is the initial response to the question or Activity 4.3, which is required for the continuation of the discussion.

> **Participant A**: The difference between a MAC and a hash function/algorithm is that the MAC function requires a key together with the message while the hash function does not - only require the message with no key.... **(Articulation of individual perspectives, IV).**

The next message in the threaded discussion reflects the same characteristics.

> **Participant R**: MACS and hash functions have different properties thus must be used in different situations according to the purpose that one is trying to achieve. I believe that within other posts it has already been defined when to use MACs. **(Articulation of individual perspectives, IV).**

The following posting by the tutor is an example of facilitating discourse where sincere attempt has been made to acknowledge the contribution of the individual participants.

> **Tutor**: Thanks A and R for good responses. **(Facilitating discourse: acknowledging student's contribution).** I would like to further explore the extent to which hash functions provide data integrity (MACs certainly do)...In what situations does a hash function provide data integrity? In what situations does it not? **(Facilitating discourse: drawing in participants, prompting discussion).**

Moreover, considering the last part of the message, it can be said that this posting can be classified as the genuine approach to engage the participants for the advance refinement of the concept. However, once again this initiation could be resulted in fruitful achievement if the participants are ready to be involved in the mutual negotiation.

The next three postings have immense significance to reflect the explicit characteristic of the process of negotiation happened within the boundary of collaborative environment.

> **Participant R**: The process of digital signatures has primarily two objectives: The provision of data integrity (assurance that data has not been altered by unauthorized people)........ **(Articulation of individual perspectives, IV).**

This posting is the articulation of individual perspectives in the form of possible effort to answer the question presented by the tutor.

> ***Tutor:** Dear R, Hash functions are indeed often used in digital signatures schemes. Do you think the hash function helps providing data integrity in case of digital signatures? **(Direct instruction: present question).**

> ***Participant R:** Yes indeed. If the message transmitted is for some reason altered ... **(Articulation of individual perspectives, IV).**

> ***Tutor:** Yes, just wanted to make sure this is very clear. **(Direct instruction: confirm understanding through assessment and explanatory feedback).**

Considering the nature of these postings (marked by *) these dialogues are the distinctive example of IRF sequence of traditional question-answer mechanism. As mentioned earlier, this process might have significant cognitive benefit; however that advantage could be confined within the participating individual. The impact of this discourse on the greater audience, mainly on other members of the group is quite difficult to realise as they are not integrated within it, and the tutor makes no move to check that they are, although appears to believe that the point has been clarified for all participants. However it has been mentioned in Chapter six that in the collaborative setting the state of evolving knowledge must be continually displayed by the collaborating participants to each other. Therefore even within an agreed situation, there should be some evidence from the participating individuals indicating how the interpretation is related to their existing belief. Otherwise it is difficult to gauge the mechanism of developing the shared understanding through mutual consensus.

Interestingly, in the next posting, there is no evidence of accommodating the concepts discussed in the previous thread. This is merely an example of individual interpretation of the question of Activity 4.3. And a similar example of IRF mechanism could be represented through the following discourse between the participant W and the tutor.

> **Participant W**: The hash can provide data integrity under the condition that the hash value is protected against alteration, e.g. by exchanging the hash over an alternative (trusted) communication channel separate from the message...... **(Articulation of individual perspectives, IV)**.

> ***Tutor**: W, You're right, the integrity of hash values themselves has to be protected. **(Direct instruction: confirm understanding through assessment)**. But what is the alternative/trusted channel in your example? **(Direct instruction: present question)**.

> ***Participant W**: True, but the hash value could be under control of 'aaa.net' while the file is provided for download on site 'bbb.net' (e.g. with mirror sites.)... **(Articulation of individual perspectives, IV)**.

The explicit existences of these IRF cycles clearly demonstrate the fact that the objective of organising this discussion forum is a simple technique to assess the individual understanding.

It is not possible to represent all the 18 messages presented in the discussion forum. Therefore, to comprehend the general nature of discourse, modified Murphy's model has been used for the categorisation of the messages in terms of their specific attributes towards collaboration.

Applying modified Murphy's model to Activity 4.3

Murphy (modified) category	No. of messages
Social presence (S)	12
Articulating individual perspectives (I)	10
Accommodating or reflecting the perspectives of others (P)	0
Co-constructing shared perspectives and meaning (C)	0
Building shared goal and purposes (B) Organisational level discourse Practice level discourse	0 0
Producing shared artefact (A)	0

Table 10.5: The number of messages with distinctive characteristics from the discussion in Activity 4.3

Since each message might contain several indicators, the total in Table 10.5, adds up to more than 18 (the total number of messages in the threaded discussion).

The data depicted in Table 10.5 conveyed this message that in the name of collaborative discussion, in this learning space the individual cognition got higher priority than the group cognition. Here the objective was to assess the change in individual cognition due to social interaction where the assumption was that the cognitive conflict would be resolved through the process of self-initiation. The qualitative analysis of the data reconfirms this. The other messages in this discussion forum displayed the same characteristic of the cognitive mechanism

being restricted to the lower order cognitive process like articulation of individual perspectives. For example,

> **Participant P:** Hash functions do not provide protection against malicious attacks by third parties - you would use a MAC for this. **(Articulation of individual perspectives, IV).**

> **Participant R:** The difference between a one-way hash and a MAC (Message authentication code), is that the hash verifies the uniqueness of a message. **(Articulation of individual perspectives, IV).**

In fact, in this whole discussion thread the majority of the postings look like a monologue. From the nature of the messages it is difficult to assume that this Activity is meant for collaborative discussion; instead it looks as if it is the responsibility of the participants just to disclose their individual understanding. Some extension of the concepts has been made by particular individuals just as a requirement of the questions introduced by the tutor during the course of discussion.

10.5 A critique of the outcome of the analysis of the threaded discussions in Case Study four

The result of Case Study four is not radically dissimilar from Case Study three. In general we have observed that the traditional assumption about teaching and learning is still quite dominant in Higher Education. Although in the recent years, especially for the online environment, the term 'collaboration' has become a widely used 'mantra'; the reality in terms of its implementation is still very much restricted to an individual epistemology. It is true that the collaborative approach does not deny that individuals often think and learn on their own, however to achieve an effective outcome from collaboration, it is important to study how the process of learning and cognition takes place at the group level. Or in other words, it is essential to monitor how the extensive negotiations among the group members affirm a meaning as a shared one.

As proposed by Stahl (2004), the term 'shared knowledge' is ambiguous. It can be interpreted as the similarity of individuals' knowledge, i.e. the knowledge in the minds of the members of a group happens to overlap and their intersection is

'shared'. From another perspective, shared knowledge can be defined as knowledge that gets shared, which means some individuals communicate what they already knew to others. And finally there could be another category of group knowledge, i.e. the knowledge that can be interactively achieved in discourse and may not be attributable as originating from any particular individual. However while the first two interpretations of shared knowledge can be used in case of individual epistemology, the third definition might be justified as an emergent property of the discourse. As mentioned earlier the overall concept of collaborative learning cannot be described as just a technique of fostering individual learning, it is much more focused on the interactional achievement of group learning. The critical analysis of the messages around Activity 2.1, 2.2, 4.2 and 4.3, demonstrate that the term 'shared knowledge' has been interpreted from the first two perspectives defined by Stahl, as opposed to the third one embracing the idea of 'shared knowledge' through establishing the 'joint understanding' of the meaning.

In practice, the tutor's assessment has to make a balance between the attainment of an individual and the overall collective effort to develop the knowledge within a group. Moreover, there is a clear need to change the conventional approach of assessing the individual performance, and tutors will need to adopt the new epistemology of community based learning. In fact, the implementation of that perception needs another set of educational goals and associated context where a group of participants can work jointly around a shared problem and can develop new understanding by appreciating the value of multidisciplinary (the authentic experience of the participants in different contexts) and interdisciplinary knowledge (the content based knowledge).

10.6 Analysis of the interview data

In this section I will represent the information acquired in the course of the semi-structured interview with the tutor. These questions are unambiguously associated with the methodology of facilitating the group discourse to attain the purported outcome of collaborative discussions. This is an attempt to make a relation between the perception of the tutor about collaboration and their initiation to translate that assumption into real life practice.

1. According to your perception what is collaborative learning?

Response: Any environment where people come together and change their views is a collaborative environment. Collaborative learning means the change in thinking, the change in perception because of the interaction with others, mainly because of the collective sharing of experiences.

In any social learning environment, without extensive negotiation it is quite possible to restructure the existing cognitive system. However in this process, the change in individual understanding is fundamentally a cognitive reorientation of an individual mind and the process of reorientation may not necessarily happen within the practice environment. The presence of alternative perspectives itself can accelerate the process of individual knowledge development; however in this process the change in the cognitive system is difficult to investigate as it is a private mental process. Primarily it is a process involving the aspect of constructivism where the individual epistemology is the subject of interest, which is very different from the collaborative knowledge construction implying an interactional constructivist epistemology. From this point of view, this statement by the tutor is much more oriented towards individual epistemology rather than intersubjective epistemology.

2. Do you expect any distinctive learning outcome from the collaborative approach?

Response: No, not as such. The learning outcome of the collaborative approach could be same like any other socio-cultural learning. In this mechanism, everybody can take away something from the mutual interaction, and the respective change in their perception or understanding is learning.

Once again in this response, the individual constructivist epistemology has been emphasized. From this point of view, the collaborative situation can be regarded as the conditions and support for learning, but collaboration is not intrinsic to the learning itself. However, in a true collaborative situation it is not sufficient to presume the change in the individual understanding, it is important also to count the process of meaning making or knowledge building in the interaction that cannot be attributed to any individual group members.

3. What are the conditions (or factors) you have to take into your consideration to make collaborative learning successful?

Response: Mainly you have to think about structured activities, and good facilitation.

In terms of the most optimistic view of collaboration, the group members can naturally gain knowledge by engaging in miraculous interactions. However, the recent evolution of collaborative learning suggests that the actual mechanism of collaboration is quite far away from this natural process and closer to teaching methods. Therefore, the activities should be structured in a way that can favour the emergence of productive collaborative interactions. It specifies that the activities itself should demonstrate the essential requirement of group interaction to develop the joint understanding of the meaning as opposed to the sheer necessity of articulation of individual understanding. In line with that there should be precise characteristic of the term 'facilitation' by the tutor as this specific nature of involvement can be resulted in the more iteration of communication among the participants. In fact the process of facilitation should be the involvement without interfering with the social dynamics of the group. Consequently, the direct instruction should always accompany the mechanism of facilitation as the former might limit the communication between the tutor and specific individual.

4. In terms of your perspective what would be the tutor's role in the effective collaborative discussion?

Response: The tutor's role mainly would be the orchestration or oil the wheel of the group. It is always better to encourage the participants to contribute more in a critical and analytical way. In terms of my perception, the deconstruction of a previous assumption is the most constructive part of learning. And to achieve that learning outcome, it is important for every individual to consider the different viewpoints of others. Therefore I always encourage everybody to present their viewpoint during the discussion.

Considering the role of the tutor as the facilitator of the collaborative discourse, it could be expected that the tutor should provide prompts or cues to achieve the real outcome of the intersubjective learning. It is true that during discussions, the

deconstruction of previous assumptions could be expected and as a result cognitive conflicts could be aroused, inadequate reasoning could be exposed, and higher quality understanding could emerge. However, here the focus is no longer on what might be taking place in the heads of individual learners or how the individual learners resolve the issues of cognitive conflict by themselves, but the on what is taking place between and among them in their interaction, or how the individual participants resolve the conflict through the process of extensive negotiation with others. Consequently, the tutor's role should be projected to foster the interactional achievement through the process of thesis-antithesis and synthesis as opposed to just motivate the participants to externalise their understanding and develop knowledge by means of collaboration with one self. Interestingly, it has been observed in the threaded discussions that most of the cases, the tutors invite the alternative thoughts from the participants, but no further initiation has been observed to make sure that the participants do really engaged with each other to establish the common understanding of the meaning.

5. How can you ensure the maximum participation in the collaborative discussion?

Response: I have no doubt that if we have a bunch of 20 participants, who are extremely interested and engaged in their professional fields, and then probably they are the ideal one for collaborative discussion. However, very often I observe the acute lack of involvement. Therefore, most of the cases rather than oiling the wheel, I have to drive the group and even make threats some time.

As discussed earlier, the participation in collaborative discussion depends on various factors. First of all the participants should realise the actual requirement to make a collaborative learning successful. This requirement as well as the goal of the learning environment should be reflected through the specific task design, as well as the strategic involvement of the tutor in the learning process. As collaboration is a complex and subtle process, they have to realise the precise demarcation between the mere discussion and collaborative discourse. And in practice this conceptualisation can provide the impetus to analyse the participation mechanism from a particular point of view. The internalisation of the concept of

interdependency could result in more participation, provided the group members can comprehend the term 'participation' from a more analytical point of view as opposed to being a mere administrative requirement for the course.

10.7 Conclusion

Once again, an effort has been made to establish a relationship among the intertwined factors of collaborative learning, the task design, the nature of discourse and the perception of the tutor about collaborative learning and the outcome of the collaborative discussion. These relationships has been represented in the following Table (10.6)

Factors	Case Study one
Tutor's perception of collaboration	Limits collaboration to discussion
Nature of task design	Not explicit about collaboration
Tutor's role	Assess individual understanding
Low level messages	91
High level messages	7

Table 10.6: Summary of the findings of Case Study four

Since each message might contain several indicators, the total in Table 10.6 adds up to more than 82 (the total number of messages in the threaded discussions of Activity 2.1; Activity 2.2; Activity 4.2 and Activity 4.3).

The number of low level messages is the sum of all the messages, across all the activities in Case Study one, that are categorised as: 'social presence' (S) + 'articulation of individual perspectives' (I) + 'accommodating or reflecting the perspectives of others' (P).

The number of high level messages is the sum of all the messages, across all the activities in Case Study one, categorised as 'co-constructing shared perspectives

and meaning' (C) + 'building shared goal and purposes' (B) + 'producing shared artefact' (A).

From this tabular representation (Table 10.6), it is quite clear that,

- The tutor seemed to have an idea of what could happen in socio-cultural learning only, as opposed to the precise requirements for a collaborative situation.

- Consequently, neither there was any real expectation of it, nor that learning would happen in the process. Therefore, the general nature of discourse was predominantly confined in the lower order cognitive process like the articulation of individual perspectives to others.

- The idea of potential collaboration among group members was not followed through in the way the task was designed, or the tutor conducted the process of discussion.

In conclusion, from this overall analysis it is evident that to achieve the purported outcome of collaborative interaction, there is a need to shift away from the individualistic notion of learning and cognition. It should be assumed that collaborative knowledge building consists primarily of forming a group, facilitating interaction among the multiple personal perspectives brought together, and then encouraging the negotiation of shared knowledge (Stahl, 2006).

Chapter eleven: Reflection and conclusion

11.1 Introduction

This final Chapter could be started by citing the interesting comment made by Laurillard (2008). As she (2008, p. 1) observes wryly,

> 'Education is on the *brink* of being transformed through learning technologies; however, it has been on that brink for some decades now' (p.1).

Indirectly, this remark highlighted the fact that the revolutionary outcome expected from integrating the technology with the existing educational approach, has still not been attained properly in the last few decades. As an obvious reason, we can say a step change in some traditional practice is never a matter of simply using new tools – it is a matter of using them in a particular spirit. And the same principle can be applied for the concept of computer supported collaborative learning or CSCL. As Stahl (2006) has argued, the computational power of personal computers can help the field of computer supported collaborative learning to flourish, as the software can support the collaboration process and manage its complexity. It has the capability to organize the sharing of communication, maintaining both sociability and privacy, it can personalize information access to different user perspectives, and can order knowledge proposals for group negotiation. In a nutshell, software functionality can present, coordinate and preserve group discourse that contributes to, constitutes and represents shared understandings, new meanings and collaborative learning that is not attributable to any one person but that is achieved in group interaction.

However to challenge these collaborative digital technologies to deliver a genuinely enhanced learning experience, it is essential to comprehend the fundamental theoretical assumption of collaborative learning principles especially from the perspective of how students learn in this new approach of teaching and

learning. Otherwise the overall approach cannot result in any significant change in traditional practice. From the literature, citing the comment by Lipponen (2001):

> Although the new technology and the theoretical and pedagogical ideas support each other, the attempt to promote educational use of CSCL technology, and at the same time implementing new pedagogical and cognitive practices of learning and instruction, appears to demand the utmost of both teachers and students. Many of the technical, theoretical, and pedagogical insights have not been transformed into widely adopted practices of teachers and students (p. 11).

Therefore, it is quite possible that from the technological perspectives, the possibilities could be endless and effortless, however from the implementation point of view, it could be rather challenging, especially in terms of how to implement the theoretical assumptions of effective collaborative interaction into the real practice of asynchronous online discussions.

In this empirical research deliberate effort has been made to illuminate the existing uses of collaborative interactions in the area of asynchronous online discussions, and from this analysis recommendations have been made to highlight what would be the ideal approach, bearing in mind the fundamental proposition of collaborative learning. This Chapter provides a synopsis of what has been done in this research and how the outcome of the research can enrich the experience of CSCL research. Furthermore, this Chapter focuses on the limitation of this empirical research as well.

11.2 The general conclusion to be drawn from the analysis of the data

At the beginning of this section, it is better to summarise the relationship which we have observed in each individual Case Study among the tutor role, tutor perception of collaborative learning, nature of task design and total number of messages analysed in the category of lower order and higher order cognitive activities. Mainly the intention is to highlight the relationship between the perception of the tutors about collaboration and its immediate impact on the

associated processes of collaborative interactions (as the role of the tutor and task design could be influenced greatly by their individual interpretation of collaborative learning).

Factors	Case Study one	Case Study two	Case Study three	Case Study four
Tutor's perception of collaboration	Limits collaboration to discussion	Uses collaboration but limited to joint production	Limits collaboration to discussion	Limits collaboration to discussion
Nature of task design	Not explicit about collaboration	Explicit about collaboration	Not explicit about collaboration	Not explicit about collaboration
Tutor's role	Provides information about the subject matter	Encourages development of the joint output	Provides information about the subject matter; facilitates the process of the IRF model	Assesses individual understanding
Low level messages	73	155	84	91
High level messages	34	106	9	7

Table 11.1: Comparison of findings from the four Case Studies in terms of the contextual factors investigated and the outcomes in terms of quality of messages categorised.

Low level messages are the sum of all the messages categorised as 'social presence' (S); 'articulation of individual perspectives' (I) and 'accommodating or reflecting the perspectives of others' (P); across all the activities in individual Case Study.

High level messages are the sum of all the messages categorised as 'co-constructing shared perspectives and meaning' (C); 'building shared goal and purposes' (B) and 'producing shared artefact' (A); across all the activities in individual Case Study.

Table 11.1 reveals that the participants' interactional involvement with the collaborative situation appears to be highly influenced by the way the practice environment has been designed. For example, the task design with an explicit requirement of collaborative engagement has achieved more collaborative interactions compared to the situations where it is not so precisely defined. It also suggests that the nature of involvement of the tutor can influence the dynamics of the learning process to a considerable extent. Finally, it supports the suggestion that these two factors are likely to be guided by the perception of the tutor about collaborative engagement. If the tutor cannot successfully differentiate between the collaborative interaction and the socio-cultural learning, the learning outcome may be restricted to a process of mere information sharing between students.

From this portrait of the general findings as well as from the elaborative analysis of data in the previous Chapters, we might say that probably the two different fields, one 'the field of CSCL research' and two 'the application of CSCL theories in practice' are still far away from each other. Once Laurillard (2002) commented that a relatively low proportion of academics read the research journals on teaching in their subject, reading is now a luxury for academics. In a different way, we can say that while managing the tremendous work loads of teaching in the Higher Education, maybe it is not possible for the tutors to read all the recent articles published in the journals of CSCL research (although they are devoted entirely to informing the teacher about developments in this specific area and about teaching strategies based on experience in the empirical research). Moreover, there are now many ways of categorising the collaborative learning experience, too numerous for the teaching community to embrace and use. They may be instantiated in specifically designed collaborative environments, but

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mostly of these do not reach mainstream tutors (Laurillard, 2009). The critical issue for tutors, however, is to apply the underlying pedagogical theory into practice, shared by all these CSCL formats.

If they believe that, the collaborative learning is fundamentally the use of teaching and learning strategies in which students learn with and from each other (this general belief are explicitly highlighted several times in their interview responses), then in this process there should be some sort of indication which will reveal the gradual progress of knowledge construction within the boundary of group discourse. Therefore if the particular learning outcome of the collaborative approach is being considered as 'the joint construction of meaning', then rather than solely focusing on the traditional individual based assessment, intentional endeavour should be made to recognise the process of knowledge development as the collective actions of several individuals.

Throughout this thesis, it is never being said that the participating individuals did not create knowledge through mere interactions with one another. By refereeing the view suggested by Spector (2000), McConnell (2006) proposed that when students interact with each other, we can expect some changes, which might be happening in their abilities, attitudes, beliefs, capabilities, knowledge and understanding, mental models and skills. The initial interaction with the other individuals or the interaction with the learning resources might be considered as an impetus to restructure the existing cognitive schema which might be attributed to the cognitive processes of self – initiation, like collaboration with oneself. Therefore, still in this situation, the participant's existing knowledge base could be extended which has been referred as a 'change' from Spector's point of view, where there is no essential demand to collaborate with one another for the joint construction of meaning.

However from the pure theoretical perspective of collaborative interaction, this sort of apparent change in the individual cognition by the process of self-explanation is not the central focus of study; the objective is to enhance the individual knowledge and understanding by the supportive interaction of the individual and the group in which he or she resides.

As it has been proposed earlier, the internal mechanism of knowledge construction by the individual is quite difficult to study, and it is easier to follow

the process of social knowledge building, as the cognitive value of externalisation in social interaction is based on a process of making internal processes of thought visible (Collins, Brown & Holum, 1991; Lehtinen & Rui, 1997; Lehtinen & Repo, 1996; Pontecorvo, 1986; Scardamalia & Bereiter, 1989). If we consider the fundamental principles of CSCL research, it is quite evident that the process of social knowledge construction can only be monitored if the communication process, that is the individual utterances and their subsequent responses, are visible to the researchers. Similarly for the tutors, the effectiveness of the collaborative interactions can only be measured by getting the explicit evidence of the group interaction, rather than imagining the unseen cognitive mechanisms happening within the individual mind which cannot normally be observed 'overt, explicit and concrete' (Brown & Palincsar, 1989, p.417). For example, the extensive negotiation happened in the course of interactions in Activity 3, group 4 for Case Study two is the ideal example of collaborative interactions where the knowledge development is explicitly demonstrated through the utterances of the individual postings.

However, from the practical point of view the issue is (as we have observed in all these Case Studies), that the practitioners are not fully confident of how they can appraise the efficacy of the interaction, and most relevantly, to evaluate how far the objective of using this kind of collaborative interaction has been efficacious compared to the individualistic mode of learning.

In this context the focus should be on identifying intersubjective learning, which should be done by selecting the uptake events in which one participant takes up another's contribution and does something with it.

Interestingly in this research, we observed three different situations of this kind throughout these Case Studies:

- The participants have accommodated the perspectives of others with direct agreement in terms of the principal idea of the message, but asked for further clarification and elaboration.
- The participants have accommodated the perspectives and externalised the personal understanding as the response to the question posed by another group member, which might be categorised as the further explanation or elaboration of the concept.

- The participants have accommodated the perspectives but there is explicit disagreement.

In terms of Suthers (2005), the fundamental characteristic of intersubjective learning goes beyond an information sharing conception of collaborative learning. According to this perspective, interpretations can be jointly created through interaction, in addition to being formed by individuals before they are offered to the group.

Considering this proposition, when the multiple perspectives are adopted by individuals in the process of intersubjective learning, there could be possible changes in the existing cognitive schema through the learner's efforts at meaning making exclusively happening in the intra individual plane. However, once this individual interpretation is represented through words or utterances, this new information should be recaptured for further negotiation, as without negotiation the dialogue could be transformed into monologue, the function of the interlocutor being reduced to that of a simple receptor of the message (Moeschler, 1985).

In this context it is important to highlight that an intersubjective epistemology is distinguished from finding common ground through a participatory process within which beliefs are enacted without necessarily being mutually accepted (Suthers, 2005). Therefore, the continuous process of adjustment of meaning will be a major determination of what will be internalised at an individual level (Dillenbourg, 1996). The mere progression of certain cognitive mechanisms, like asking a question, or elaboration of the concept after accommodating multiple perspectives of others, cannot be attributed to the intersubjective learning if it is not further negotiated for the mutual understanding.

Similarly, in practice, it is also possible for conflict to occur and not reach the stage of resolution; in that situation, participants may take away differing meanings, without moving forward for co-construction through conflict resolution. As stated earlier, from the perspective of individual epistemology, the development of conflict itself could be sufficient as an active ingredient for further knowledge construction, but from the collaborative perspective, the co-constructed resolution of such conflict is much more desirable.

In the literature, from a different attitude, it has implied that the outcome of collaborative effort may well not be an answer or an artefact, or some similarly, accessible product. It is fairly possible that joint enterprises are entered into the

collaborative interactions simply in order to consolidate, elaborate or refresh understanding of some phenomenon of shared interest (Crook, 2000). Conversely, if we rely on in this theoretical proposition, it is virtually unattainable to differentiate between the mere socio-cultural learning and the collaborative learning from the perspective of group cognition. The process of consolidation or elaboration can only embrace the reprocessing of the reified facts. Therefore, the cognitive processes might not be comprised of certain characteristics necessary to attaining mutual understanding of what is meant by certain terms and expressions, and necessary for learning in a specific knowledge domain by means of interpersonal interaction. As the collaborative knowledge can only be achieved interactively in discourse, therefore until and unless, the negotiation of the different perspectives is answered in acceptance of a common result, such result cannot be accepted as collaborative knowledge. Therefore, in spite of the existence of the artefacts in the form of a summary in some instances, the process associated with their production cannot necessarily gratify the rudimentary requirements of what counts as collaborative learning. In these cases the artefacts have been produced by an individual initiation (like Activity 3 and 5 in Case Study one; all the Activities except Activity 3, group 4 in Case Study two and Activity 2.2 in Case Study 4) and not negotiated considerably with the other group members for its subsequent modification as a group product.

Laurillard (2009) has suggested in her article that Web sites and podcasts may appear to be exciting new forms of teaching method, but in terms of support to the learning process, they play exactly the same role as conventional books and lectures - they present the teacher's concept. Correspondingly, if there is no referential sequence in the discussion thread, if there is no negotiation among the individuals' perspectives for the clarification of meaning, if the discussion thread is just the accumulation of the individual postings then it is not substantially different from the pedagogical approach of traditional instructionism.

Instructionism tends to prioritize the presentation of the concept by the teacher, a task goal, which the learner attempts to achieve, and then extrinsic feedback from the teacher in terms of right/wrong comments, hints, new materials, or a different task. There is no special focus on interactions with other learners (Laurillard, 2009). As proposed earlier, if there is no significant discussion among the

participating members, then the initial contributions by the individuals can only act as the multiple presentations of the concept where the task goal would be the extension of the current understanding of the individuals by incorporating the facts from others' contributions.

Therefore, if the same learning mechanism takes place in the social learning environment, especially in the collaborative situations, it would be as if, in the name of social constructivism, we were in fact simply using instructionism, where there is no need for the multidirectional approach of dialogue among the participants. Only the exposure to diverse thoughts would be regarded as adequate to attain the learning goal in the form of 'acquisition of knowledge'; as we know, in the case of individual learning, during the attempt to understand something, an individual might try to explain it to him/herself. And research on explaining to oneself (Chi et al., 1989) suggests that self–explanations make up constructive cognitive activities that frequently lead to the acquisition of new knowledge (the learning mechanism which has been already highlighted in the previous section).

However the point is, if the learning environment is designed to implement the collaborative learning principle, then it should follow the methodology or the process of knowledge construction exclusively meant for that pedagogical design. Here the interaction itself will enable the participating individual to progress gradually from lower to higher mental functions, as opposed to simply providing the idea of different thoughts which could be alternatively done by just recommending different resources available either in the library or Web sites.

Therefore, if the practitioners try to translate the idea of social constructivism into practice in the form of collaborative interactions, they have to know first how they can make the methodology of this new way of teaching and learning different from the most dominant practice of individualistic learning. Or in other words, if CSCL is to be conceived as a fundamentally new educational form, rather than just a technique for fostering individual learning, than it seems that something like the third reading of 'shared knowledge' needs to be explicated (Stahl, 2005). And in practice the internalisation of this specific learning mechanism is so important that even if the learning situation does have the possibility to foster the collaboration through particular task design (as we have observed in Case Study

two), the misinterpretation of the term can cause sufficient hindrance to facilitate the expected approach of negotiation required for effective collaboration.

Therefore, in a nutshell, it can be said that, in order to pursue and sustain a high-quality educational experience, a deep understanding of the learning process is required. The tutors are required to go beyond the surface level of interactions in order to understand the social and the cognitive processes involved. And in practice this internal understanding could be enormously beneficial for them to design (by effective task design and by strategic involvement) the learning situation to achieve the maximum productivity of collaborative interactions.

11.3 The contribution of the research

The objective of this thesis was neither the hypothesis testing nor the development of another CSCL theory. There was no intention to investigate any further independent variable to establish a casual link between the conditions and their effects on collaboration.

However this research takes a critical look at analysing the mechanism of knowledge construction happening inside the boundary of the asynchronous discussion forums that are often referred as 'collaborative environments'. The objective of the research is to investigate how far the contemporary design of the learning environment as well as the process of facilitating the general approach of collaborative interactions are compatible with the theoretical assumptions of ideal form of collaborative learning. It was expected that the research outcomes would be constructive in refining the current designs and underpinning models through investigating a set of Case Studies.

Therefore, at the end of this research it can be generally commented that the intended applications of all new CSCL formats need a significant change in perceptions about students' learning in CSCL environment and what makes it possible. The tutors as well as the participants should realise the importance of collaboration between learners as a way of motivating a high level of processing of ideas, argument, justification and evidence. In this research a sincere attempt has been made to make explicit the impact of design-based scaffolding approaches and management-based approaches (Reimann et al., 2006) to achieve

the effective outcome of collaborative interaction. In other words, the findings manifest the relationship between the tutors' effectiveness in terms of designing the collaborative environment as well as facilitating the process and its influence on the students' experience of the methods of collaborative interactions. Furthermore, to define the desired outcome of the collaborative approach, this research puts a critical emphasise on portraying the whole collaborative approach in terms of processes and their indicators along a continuum.

In recent years, the CSCL researchers hypothesised that it is not so much the individual student who learns and thinks, as it is the collaborative group. However, the understanding of the group cognition (i.e. the learning in collaborative group) is not simply a research subject for the CSCL researchers. If the understanding of the group cognition is the central component for achieving the intended outcome, then it is significant for the tutors also to comprehend its meaning, especially the mechanism of identifying the presence of 'group cognition' in the real online situation.

So far, several researchers have looked closely at the types and patterns of interaction in the asynchronous discussion forums. However to this point, CSCL research has not made any conscious attempt to precisely identify and describe the particular phase of collaborative interaction which can provide the unambiguous confirmation of the co-construction of knowledge by the group itself where the group cognition has been hypothesised as the independent cognitive system of the group as a whole. This thesis made an attempt to show how the concept of group cognition can be included in the learning environment by introducing the aspect of practice level discussion after the initial development of collaborative knowledge. It has been clearly demonstrated that for the transformation of collaborative knowledge into the shared artefact, what is needed is to allow a proposed knowledge artefact to be successively changed by the negotiating parties until all of them agree that the object is now an acceptable representation of the group knowledge.

Therefore, in this thesis, Murphy's (2004) original proposition to identify and measure the presence of collaborative interaction in an asynchronous discussion forum has been extended by demonstrating that the existence of a shared artefact in the practice environment is not the single criterion to label

the learning situation as a collaborative one, it is essential also to analyse the production-focused discourse.

Even the presence of certain cognitive mechanisms (like elaboration, explanation, question asking etc) cannot guarantee the effective collaboration until and unless their individual effect is included as a feedback in order to produce a higher quality shared artefact as the revised action. In the example of Case Study two in Chapter eight (representation and analysis of data), the threaded discussions around the Activity 3 group 4 have demonstrated the significance of the practice level discussion for transforming the attributes of the artefact from the individual contribution to group achievement.

Moreover, this thesis also emphasised that if the aspect of co-ordination is accountable for the efficacious execution of the collaborative task, then there could be the expectations of another iterative course of conversations which can be classified as the organisational level discussion. The transition from the initial planning of task to the final strategic approach can only be achieved if the process involves the idea of accommodating the feedbacks of all the participating individuals. For example the Activity 2, Activity 3 and Activity 6 in the Case Study two have truly represented the significance of organisational level discussion to maintain the group cohesion in the collaborative setting.

Therefore, considering the above propositions, the modified Murphy's model including the proposition of organisational and practice level discussion (refereed in Chapter five), as the content analysis scheme can be considered much more effective for capturing the real learning mechanisms of collaborative discussions.

Furthermore, once again this thesis reinforced the idea that, apart from identifying the six consecutive processes of collaborative interactions (as defined by Murphy), it is important to analyse critically the process of group meaning making from the qualitative point of view. For example the evaluation of the process of group meaning making has forced to label the learning situations of Cast Study two (except Activity 3, group 4), as the in effective collaborative environment although in all of these instances the learning environments have the existence of an artefact.

Likewise, taking into account the model of socio-cultural learning (Fig.2.1, in Chapter two) and the collaborative learning (Fig. 2.2, Chapter two), this study made an attempt to differentiate the learning mechanisms of the asynchronous discussion forums from these two different pedagogical perspectives of social learning. For example, this theoretical distinction has influenced to label learning environments of Case Study one, three and four as the socio-cultural learning environment as opposed to the collaborative one.

Moreover, the associated task design and the role of the tutor in the learning environment has been scrutinised to explore the underlying pedagogical assumption of social learning. Still, this type of differentiation technique has not been used widely before. The objective of this research was not to compare the knowledge gain under different pedagogical approaches, but the differentiation technique used does provide insight to the practioner to design as well as to criticise their role in the learning situation if they are interested towards the group achievement of interaction (through the collaborative interactions) as opposed to the benefit of individual cognition (through the socio-cultural learning).

It is a well accepted fact that the challenge we face is how to transfer evidence-based results and principles of multimedia research (Mayer, 2005) into classroom. As described by Urhahne et al., (2009), a key element of this challenge is the role of the tutor. Therefore, rather than focusing on technology and developing computer literacy, teachers might be more effectively supported by new visions for teaching and learning with technology (Ertmer, 1999). It could be assumed that an instructional approach targeting the role of the teacher might help to promote computer-supported learning (like computer supported collaborative learning) in classroom practice (Urhahne et al., 2009). Therefore, taking into account all these contributions of this empirical research, there is a great opportunity to develop a sound pedagogical framework that might support tutors better in designing collaborative learning.

From the general findings it can be suggested that the overall collaborative discussion based learning can be divided into the three associated phases.

1. Pre discussion phase, mainly associated with the design of the learning environment.

2. Within discussion phase, mainly the process of developing the collaborative knowledge through interactional accomplishment.

3. Post discussion phase, mainly the assessment of the collaborative knowledge.

These are elaborated below, drawing on the findings from the Case Studies to clarify what they need to achieve.

Pre discussion phase requirements

The research findings support the fact that the success, and especially the orientation of collaborative discussions, is dependent on an understanding of the term itself by the tutors as well as by the participants. Therefore, in this pre-discussion phase there is a requirement that,

- The tutors as well as the participants should clarify the difference between the socio-cultural learning (mere discussion based learning) and collaborative learning (producing a shared output).

As collaborative learning has been defined theoretically as a special act of socio-cultural learning, therefore it is important to consider what specific measures have to be taken in terms of instructional support for the participants to formalise or objectify their collaborative knowledge as a shared artefact. For example as we have observed in the Case Study two;

- The specific requirement of producing the agreed group report or the diagram helps to converge the diverse perspectives of the individuals for the shared construction of the group product.

Furthermore, as observed in Case Study two;

- Deadlines and time pressures are the common constraints to achieve the purported outcome of collaborative interactions.

Therefore, to encourage deep learning and comprehension learning, the tutor should design the task considering the following criteria.

- There should be a guideline regarding how to construct the group.
- A description of the specific nature of interaction expected for the process of collaboration.
- The explicit formulation of the aim or purpose of the task.

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- The overall structure of the course should provide ample time for the participants to discuss their multiple perspectives for the shared understanding of the meaning.

Within discussion phase requirements

If collaborative learning should be a combination of social learning with constructionism (Laurillard, 2009); then in order to include the fundamental aspect of group cognition, there is a need to consider the discussion around the shared artefact. Here the idea of constructionism should not be limited only to the production of an individual artefact; it should be extended to the production of a shared artefact, which will signify the cognitive achievement of the group as a whole. Furthermore, it has also considered that the state of evolving knowledge must be continually displayed through individual utterances by the collaborating participants to each other as in the case of computer mediated asynchronous interaction, there is no scope to gauge the individual reactions through gesture, intonation, hesitation, turn-talking, overlapping, facial expression, or bodily stance. Therefore as an obvious requirement of this phase, there should be certain significant stages of collaborative interactions (based on modified framework of Murphy, 2004) like

1. Social presence.
2. Articulation of the individual perspectives.
3. Accommodating or reflecting the perspectives of others.
4. Co-constructing shared perspectives and meaning.
5. Building shared goals and purposes
   (I) Organise the planning to accomplish the collaborative task
   (II) Practice level discussion – a crucial course of discussion necessary to formalise the collaborative knowledge into the shared artefact through the convergence of individual understanding.

In fact the initial four phases (although social interaction is not directly related with the cognitive dimension of the collaborative interactions, still it has its own significance to maintain the group cohesion), might be termed as the theory level

discussion, which is essential to restructure the individual cognitive system for the development of collective/collaborative knowledge. From the characteristic of the practice level discussion it is evident that this interactional phase could be composed of similar stages described in the theory level discussion like, articulation, accommodation and co-construction.

Furthermore, in the within-discussion phase, the strategic intervention of the tutor can compensate the limitation of the task design as the nature of discussion can be directed towards the collaborative interaction. One of the prime objectives of the tutors should be

- Making sure that students are creating meaning and confirming understanding, along with encouraging participation.

In some instances, the direct instruction is required to achieve deep and meaningful learning. However the direct instruction in the form of assessment might be advantageous for individuals to appreciate the meaning, but the nature of the communication could be narrowed between the tutor and the participant only, which is practically a contradictory method of multidirectional discourse of collaborative learning. Therefore, along with the direct instruction,

- A conscious attempt should be made to encourage the communication among the participants to establish the mutually accepted group knowledge.

Post discussion phase requirements

As observed in the research results of the four Case Studies, to a certain extent, the long established methodology of assessment is still much more dominated by the idea of an individual epistemology; it has not been extended to the group level. However, as specified in the previous section, the quality of the collaborative interaction is all about assessing the interactional process through which the shared artefact is produced in the learning situation. Therefore,

- The practitioners and assessment system should be geared up to judge the cognitive development of the group as a whole.

It has been explicitly demonstrated in the literature that in general research on information technology in education has given not enough attention to the role of the teacher, given the central part that the teacher plays in technology-enhanced classrooms (Ruthven, Hennessey & Brindley, 2004). As portrayed in the article by Urhahne et al., (2009), rather multimedia learning research has focused on learning technology and instructional design as well as knowledge, skills, attitudes, experience, and behaviour of the learner (Mayer, 2005). It is quite true that research on CSCL is basically a part of multimedia research, and this particular research project has come up with an idea of instructional design for the implementation of effective collaborative interaction in the context of asynchronous online discussions. However, the instructional design proposed in the previous sections has intertwined the role of the tutors in such a way that no longer are the tutors the quiet observers of the learning process, but they are the active participants in order to accomplish the collaborative process. The step by step guidelines listed above are not only essential to comprehend the complex mechanism of collaborative learning, but also specify the genuine rationale of acknowledging the role of the tutors in every step of collaborative interactions. Furthermore, this guideline could be useful for the participants to realise what sort of interactional engagement is required from them to obtain the desired outcome of collaborative interactions.

11.4 Implication of the research

As it has been proposed in Chapter four, the contribution of a Case Study is only understandable if we compare the results for similar contexts where the apparent variables are generally similar in character. When there is a strong commonality between the empirical situation and the practice environment outside the research, it is quite easy to transfer the knowledge/empirical results from one context to another. The primary objective of this research is to make explicit the trends of asynchronous collaborative discussion happening under certain contextual specifications (like the approximate number of participants in a group, length/duration of the discussion, the type of technology used for facilitation etc). Therefore, bearing in mind the specification of the research, the associated findings can represent the possible changes that should be designed into the learning environment for its effective transformation towards collaboration. The

research results can specify the implications considering the most noteworthy influences connected with this new method of teaching and learning, like the tutors, the participants, the technology designers, and the overall institutional approach.

11.41 For the teachers

From the general impression of the research findings, it is understandable that unless teachers view a problem as a problem, it is unlikely to be acted on (Loughran, 2002). Alternatively, explicit noticing of important events of classroom practice (in this context the online discussion forum) is critical to being able to change one's practice, because without the proper identification as well as evaluation of the problem, it is quite difficult to act differently (Borko, 2004; Mason, 2002; Sherin and vanes, 2005; van Es and Sherin, 2002).

In fact these suggestions echoed the fundamental assumptions of the 'reflective practitioners', and demand for those tutors who can critically evaluate the practice environment in order to identify the discrepancies between the learning outcome or the productivity of the pedagogical approach applied in the learning situation and the actual learning outcome which could be achieved by the effective use of that pedagogical design. Or in other words, their attitude towards the reflection on action can only be effective when it can lead the teacher to make meaning from the situation in ways that enhance understanding so that he or she comes to see and understand the practice setting from a variety of viewpoints (Loughran, 2002). In fact the knowledge gained through this sort of reflection, by criticising the practice situation from multiple dimensions, can enable the tutors to determine the necessary changes that he or she has to make for the better learning outcome of the applied pedagogical methods. Alternatively, this type of reflection is much more concerned with 'things to do or to be done, judgements of a situation demanding action' (Dewey, 1916, p.335). In terms of Schön, the phrases like 'thinking on your feet' and 'keeping your wits about you', suggest '[not only that] we can think about doing something but what we can think about something while doing it' (Schön, 1983, p.54).

As a prerequisite, promoting collaboration in online learning begins with an understanding of the concept itself, followed by an understanding and recognition

of how it might manifest itself in an online context (Murphy, 2004). However the initial assumption or the understanding about 'collaboration' needs constant evaluation throughout its application in real online situations.

Therefore, the creation of an effective collaborative environment is dependent on the educational research which should be conducted by the tutors themselves. It is not the sole responsibility of the researchers to evaluate the learning situation in order to measure the effectiveness of the collaborative discussion; the role can be taken by the tutors as well. When the research is carried by the researchers only, the research outcome normally ends up with certain recommendations, which are only applicable in specific learning situations depending on the factors which have been exclusively considered in that particular investigation. In practice, this technical-rational approach to professional knowledge, where researchers produce knowledge and theory of how to solve problems and practitioners put theory into practice is not useful (Schön, 1984). This is because professional practice, like everyday practice, is characterised by uncertainty, complexity and conflict which do not fit neatly into the model of technical rationality (Hughes, 2009).

When the tutors themselves are engaged in investigation, their initial findings could be easily tested in their practice situation; they could be evaluated in order to measure the effectiveness and could be easily modified according to the contextual needs. For example, the tutors might change the design of the practice environment by reflecting on learners' performance (this design aspect may be varied from the change of discussion topic to the change of technical infrastructure). The analysis of the learner's progress or outcome would be helpful for the tutors to make sure that the demands of the context are compatible with their pedagogic intentions. Likewise, the observation of the online discussion can impart the feedback to decide their role as well as the precise timing to be involved with the discussion forum either as a facilitator or as a direct instructor. In a nutshell, working through the different phases of collaborative interaction, should lead the tutors to a more thorough analysis of what their teaching has to do to enhance the productivity of this method.

Once Laurillard (2002) has made this proposition;

> we have to help students not just to perform the procedure, but also to stand back from it and see why it is necessary, where it fits and does not

fit, distinguish situations where it is needed from those where it is not, i.e. carry out the authentic activities of the subject expert (Laurillard, 2002, p.15).

Even though this proposition is made for learners, it is equally applicable for the tutors, if we expect the significant change of the existing practice. Or in other words, to observe the unity between problem, context and solution, the tutors should experience the problem while being engaged in their practice in real life situations (Brown et al., 1989).

However, this computer supported collaborative learning is an entirely different new type of educational experience, which requires the appraisal of online tutors' assumption about what makes students learn during collaborative interactions. And at the same time, it is also true that, we are all so caught up in our 'lived' experience (so as the tutors) that it is never easy to stand back and get a rounded and informed picture of self (Hughes, 2009).

Therefore, apart from embracing the approach of 'action research' during practice, there is a crucial need for staff development which can offer experiences that shuttle backwards and forwards between what they already know and what they are prepared to develop, between specific details and their implications in wider contexts, and between practice and reflection. In the literature Salmon (2000), has proposed that to train effective and efficient e-moderators, we need to create such training programmes that provides an online environment where the sense of emotional identity, the shifting of time, the experience of the context with all its foibles can all be experienced (Salmon, 2000).

In the same way, if we want tutors to be able to recognise the issues of collaborative learning, we must situate their learning activities, i.e. the staff development programme, within the domain of that objective, i.e. in the real virtual collaborative situations.

11.42 For the students

In recent times, due to the hype of 'Web 2.0' and its various applications, words like 'collaboration' or 'virtual community' have become familiar to the participants. However, what is not transparent is the diversity of the meanings of these terms depending on their use in different contexts.

For example, in case of social networks, the members can display companionship and social support and engage in information exchange (McConnell, 2006); however in this process the members can be present without deeper interaction and their interaction could be ephemeral. On the other hand, in case of collaborative interactions, the community of participating individuals should have a shared objective and shared approach at all times to accomplish the job of the joint construction of knowledge.

At this instant, if these fundamental differences are not clear to the participants, as an immediate consequence, they will enter into the world of formal collaborative learning environment with little apparent understanding of what it might or should mean. Therefore, the participants should be oriented towards the collaborative interactions by the effective guidance of the tutors.

At the same time, the participants should also realise that learning in the digital age is no longer dependent on individual knowledge acquisition, storage and retrieval, and collaborative learning is not the simple means of socialising and exchanging personal reactions and opinions about the subject matter. Instead, this approach is the exercise of high level cognitive activities which should result in the tangible outcome like developing a theory, model, diagnosis, conceptual map, mathematical proof, or presentation (Stahl, 2006). And to achieve this essential outcome, it is indispensable to identify not only the newly added knowledge through the individual postings but also its subsequent refinement and elaboration for deeper understanding of the concept. In both of the circumstances, whether there is obvious conflict among the participants or an apparently agreed situation, the participants can develop higher mental ability by analysis, synthesis and evaluating every new piece of knowledge proposed by individual participants.

This is the reason, McConnell (2006) has suggested the idea of collaborative assessment in the asynchronous discussion network, as he believes it is a value-laden approach to learning and teaching that seeks to involve students to make judgements about their own and each other's learning. As an essential criterion of productive collaborative assessment, in the individual postings, the students should provide explanations or elaborations of the concept coupled with reflective attitudes, factual analysis, comparison and reorganisation of ideas. This standard benchmarking to assess the quality of the postings will gradually help the

participants to comprehend others' interpretation of the concept, which gradually results in the production of group knowledge by the clarification of certain terms and meanings. Additionally in this approach the traditional assessment system is not dominating, consequently there could be greater opportunity for negotiation in more equitable platform.

11.43 For the technology designers

From the critical point of view, the design of the collaborative software should be guided by the underlying pedagogical principle of the process itself.

For example, from this empirical research, it is quite evident that for the achievement of collaborative discourse from the group cognition perspectives, the software should enable the tutor to recognise the process or to evaluate the mechanism involved in the process of producing the shared artefact. The research suggests several categories of interaction that need to be supported.

The illustrative presentation of the interactional phases in the section referred to as 'within discussion phase requirement' can provide snapshots of the process of collaboration, essential for an effective collaboration.

However, as observed in the research, in the practical situation two possible collaborative environments might emerge:

(i) The practice environment with shared artefact but inadequate discussion among the participants.

(ii) The ideal collaborative situation with the adequate interface of mutual discussions at the practice level.

Currently apart from providing the generic features of communicative technologies (like providing the mutual interactional space through BlackBoard or Web CT etc) online discussion software provides no specific measurement to assist the tutor in monitoring the process of evolving the shared artefact. They are not equipped to give an idea of the general nature of discussion under an individual category of cognitive activities, like the number of messages in the category of 'articulation of individual perspectives', 'accommodating the perspectives of others', or 'co-constructing shared perspectives' etc. This could be done, for example, by making 'emoticons' available in the social level discussion.

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A new category of 'cogniticons' could be designed to specify the associated cognitive activities. For example, the use of tagging in online discussions has been explored in tools such as InterLoc (Ravenscroft, 2010).

In fact, this tagging system can provide the benefit for both; it could be helpful for the tutors as well as for the participants. An asynchronous discussion forum could be composed of several individual threaded discussions, where it is not impossible to assume that once a particular thread will be completed, the participants will start the other one. As a consequence, it is possible that in some instances the cognitive activities like 'asking for clarification' or 'responding to questions' or 'soliciting feedbacks' and so on, mainly the activities involved in the phase of co-construction of knowledge could remain unacknowledged. As a result the process of developing the shared understanding of the meaning could be hampered and the practice situation could be a place of just sharing personal informations and the individual perspectives of the participants. However, if we can combine the categories of effective collaborative interactions defined in the modified model of Murphy with the potential power of technology, we can invent the collaborative software, which would be able to tag the individual responses according to their specific attribution towards collaboration. This tagging system would be immensely helpful for the tutor to get the feedback from the learning situation in order to understand how far the interactions moving forward to achieve the anticipated outcome of collaborative interactions. Similarly, if the desired behaviour of the collaborative interactions can be defined to the participants before starting the collaborative interactions, the tagging system can give them an idea to identify the discrepancies between the actual interactional process happening inside the practice situation and the preferred interactional process required for the successful completion of the collaborative process. In practice, this tagging system supports the vision of collaborative assessment (McConnell, 2006), where rather than taking the constant guidance from the tutor, the participants can assess the quality of interactions for the improvement of the process.

In addition, in the existing collaborative software, no specific design feature is available through which the tutors can easily access and compare all the different versions of the shared artefacts produced by different groups, for example, by

automatically storing of all the shared artefacts in a specific folder designed for a particular group. This is necessary for the evaluation of the process of its production. In conclusion, in terms of the design features, the recommendations for the technology designers would be,

- Evolution of the tagging system to identify the characteristic of the messages.
- The category of the messages would be same as defined by the extended model of Murphy. For example,
    1. Social presence.
    2. Articulation of the individual perspectives.
    3. Accommodating or reflecting the perspectives of others.
    4. Co-constructing shared perspectives and meaning.
    5. Building shared goals and purposes
        - Organise the planning to accomplish the collaborative task
        - Practice level discussion – a crucial course of discussion necessary to formalise the collaborative knowledge into the shared artefact through the convergence of individual understanding.

- The indicators could be used to specify the nature of messages under each category (detailed description has been provided in Chapter five).
- The development of the automatic storage system of the shared artefacts for different groups to monitor the change in the artefacts as an approach of assessing the change in group cognition or the development of group learning.

Ultimately, it can be said that globally networked computers provide a promise of a future of world-wide collaboration, founded upon small-group interactions. Reaching such a future will require overcoming the ideologies of individualism in system design, empirical methodology and collaboration theory, as well as in everyday practice (Stahl, 2006).

11.44 For the institution

In this research, it was not possible to include a study of the influences of the institutions on the effective outcome of the collaborative discussions. However, from the general output of the research findings, especially bearing in mind the attitudes of the tutors to facilitate the process of collaborative interactions, the research provides evidence for the claim by Bates (2000) that, if the universities and colleges want to adopt the use of technologies for teaching and learning, then much more than minor adjustment in current practice will be required. Furthermore the research findings also echoed with Bates that the effective use of technology requires a revolution in thinking about teaching and learning. Part of that revolution necessitates restructuring universities and colleges - that is, changing the way Higher Education institutions are planned, managed, and organized (Bates, 2000).

However according to Laurillard (2007) none of this will happen simply through the introduction and availability of learning technologies and resources. If radical change is to happen, and make a sustained improvement to the education system, then to some degree at least this change has to be planned and managed.

In a nutshell, "large investment in technology based teaching can be justified only if it leads to significant changes in the ways we teach" (Bates, 2000, p.119). From the administrative perspective the major challenges are the evaluation of the institution's objectives and the consideration of all those issues which ultimately decides the success of this kind of venture.

For example, considering the existing system of reward structure, if the institutions are truly intended to achieve the success of collaborative learning, their existing conception about individual attainment should be substituted by the idea of group achievement.

In terms of Stahl (2006), collaboration is often feared as something that might detract from individual accomplishments, rather than valued as something that could facilitate a variety of positive outcomes for everyone. And until and unless this realisation would be attained by the institutions it is rather unachievable to accomplish the systematic changes in the institutional practices. It is possible that some isolated changes could be initiated by a certain number of individual

practitioners, but for the central transformation of the traditional practice, the administrative support is crucially important. For the organisation of the staff development programme, or for the development of software to support healthy collaboration, there is a clear need for funding which can only be granted if the administrators can comprehend the actual transformation of teaching and learning practices that the collaborative interaction could bring in reality.

11.5 Limitation of the research and further work

As discussed earlier in Chapter four, this Case Study research strategically ignored some of the components of collaborative learning, which might be considered as the limitation of the study, but at the same time it highlights that there should be more research on these issues to flourish the practical field of CSCL research.

The investigation of human learning remains problematic as it is always a matter of complex interaction of cognitive and social factors, motivational and emotional aspects and the features of the learning context (Crook, 2000). However in this thesis, it has been hypothesised that although there is a requirement to establish the social presence and interrelationship among the participants for the effective group cohesion, this is only a necessary precondition for a purposeful and worthwhile learning experience, not a sufficient condition. Therefore, in this research, no conscious attempt has been made to show the impact of social interaction on effective collaboration. The research interest was much more inclined towards assessing the cognitive dimensions of collaborative interactions.

However, in reality affect could play a key role. As projected by Mezirow (2000), "effective participation in discourse and in transformative learning requires emotional maturity—awareness, empathy, and control... knowing and managing one's emotions, motivating oneself, recognizing emotions in others and handling relationships—as well as clear thinking" (Mezirow, 2000, pp. 10–11). Therefore, considering this specific limitation of this research, further exploration could be done in order to identify the distinctive nature of social activities which might create greater opportunity for the participants to be engaged more closely with one another. And similarly, further investigation could be done on how to design the

learning situation where the interdependency in the learning activities could be effective in the formation of social as well as learning communities.

Furthermore, in this research, the analysis of the threaded discussions illuminated the possible reasons for effective engagement or the lack thereof; and the judgement has been done by taking into account only the role of the task and the involvement of the tutor in the learning process. However, this analysis was not able to reveal participants' personal interpretation of the term 'collaborative learning' as well as personal experiences of collaboration in the practice situation. In terms of the literature, there is a need to study students' views of their own experience because it is the best way to find out what influences those features of student behaviour. If we do not see it as they do, we will not understand what they do (Becker, Greer, and Hughes, 1995). Therefore, an understanding of the students' experiences could provide insight into the outcome of the collaborative interactions (Becker et al., 1995).

Moreover, as it has been proposed in the literature review chapter, we need to be aware of cultural differences in terms of how people teach and to what extent they accept reactions from different people (Jager and Collis, 2000). Therefore the attitude of participants towards collaboration might be significantly different from one another depending on their native culture. In that situation the effective productivity of the collaborative interactions might be constrained because of the participants' interpretation as well as the experience of the learning situation. Thus, a future challenge is to study the mutual relationship between the individual notions as well as experience of collaboration and the outcome of collaborative interactions.

Finally, in this research as another contextual factor, the technological aspect has not been considered, although there could be an attempt to explore how specific features of technological systems can bring significant change in collaboration, reasoning, functions, contents and structures of discourse (Dillenbourg, 1999). Alternatively, there is the possibility to identify the interdependencies between different variables, including how specific features of the technology facilitate students' understanding or ability to solve problems in a variety of knowledge domains (Salomon, 1993; Kirschner, Martens, & Strijbos, 2004).

In fact as a summary we can say for the further enrichment of the field of computer supported collaborative learning, there should be the analytical focus on describing the systematic relations between forms of social interaction, and specific types of support or other contextual factors on the one hand, and qualities of outcome on the other.

11.6 Conclusion

From the literature it is evident that the whole concept of CSCL emerged in the 1990s, probably almost fifteen to twenty years ago. However, to date, if we evaluate the process of implementing the CSCL theories in the learning environment, we would be quite disappointed at the progress, since this thesis is the portrait of the recent application mechanisms. Until now quite a lot already is written on the theories of collaborative learning. However still that significant change in our traditional practice of teaching and learning, from individualistic learning to collective learning which was expected because of this CSCL approach, is not achieved in practice, as is evident from the empirical research reported in this thesis.

Therefore, at the end of this thesis, we can conclude that collaboration is a special act of social interaction; as a consequence, in the context of teaching and learning, we should stop using the word 'collaboration' in general and start referring only to precise categories of interactions (Dillenbourg, 1996). Through the elaborated presentation of threaded discussions and their subsequent analysis, this thesis has tried to make explicit the precise categories of interactions required for effective collaborative learning (the categories are specified in the 'within discussion phase requirement'), Furthermore, the evolution of the extended model of Murphy could be helpful

- To capture the complexity of collaborative interactions,
- To make a successful differentiation between the mere socio-cultural learning and collaborative learning.
- To provide a way of identifying the distinctive difference between effective and ineffective collaboration.

I do hope this illustration will be helpful for the future researchers, the tutors, the students, the technology designers as well as the institutions to internalise the

fundamental mechanism of establishing efficient computer supported collaborative discussions especially in the context of an asynchronous online learning environment.

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Appendix 1: Ethical consideration

As reminded by Rourke et al., (2001), questions of ethical approval and informed consent are important to all researchers and their subjects.

Moreover, they hinted that the subject of ethical consideration could be significantly different in two circumstances of online research depending on the role of the researcher in the overall discussion process. For example in case of active action research, the researcher takes part in the conference under investigation and research projects in which the researcher examines the subsequent transcript, changes the nature of the "intervention or interaction" between researcher and research subject. In this case the researcher can be easily positioned as a research participant and the ethical consideration could be more complex compared to that situation where the researcher only analyzes the transcript of a conference without participating in it, therefore has not intervened in the process of discussion and cannot be termed as a research participant as well. However, the ethical consideration is relevant even in the second criterion as often transcripts contain 'private information' that has been posted to the conferencing group. The characteristic of this research has been positioned it as the online research of the second criterion. Therefore, specific measurements have been taken in terms of certain ethical issues related to the research itself.

As a part of the ethical consideration of this research project, I have been involved in the tedious process of obtaining ethical clearance from the 'University's Ethics Approval Board'. I obtained the clearance in February, 2007. In this process, I have requested each participant to sign a conventional informed consent release form in which the standard information was provided to participants describing the fundamental issues of this research like; nature of the investigation, potential harm and benefits, how the information obtained is to be used, and how the participants can contact the researchers to discuss any concerns they may have.

The consent release form

To carry out this research, therefore, I need access to the whole online discussion discourse within your course in order to analyse the nature as well as the quality

of discussion between the tutor and the students and among the students. Permission for this has been granted under the Institute's Ethical Guidelines, and I want to explain what that means for you as a student on this course:

- I will not participate in any discussion.

- I will keep the copy of the entire discourse (as the permanent record will help me to analyse the data).

- As in other discourse analysis studies, I will quote parts of the online discourse to support the analytical categories I develop, and to support my argument.

- I can give you the assurance that you are not being tested or judged personally, but your responses are being categorised in terms of the nature of the activity of the members of a community.

- The names of all participants will be coded within the analysis process, and anonymised in the thesis and in any publications in order to minimise the likelihood of identification.

I hope you will feel able to support my research, and I will be very grateful for your co-operation. Please let me know if you have any queries.

Appendix 2: Sample interview transcript and analysis

This transcript is the example of one of the semi-structured interviews which has been conducted between the researcher and the tutor of the Case Study three.

As proposed earlier in Chapter four (Methodology), the research interview has been defined as 'a two person conversation initiated by the interviewer for the specific purpose of obtaining research-relevant information. The application of 'collaborative' approach depends, to some extent, on the interpretation and conceptualisation of the term by the individual practioners. Therefore, along with the analysis of the threaded discussion in the online course, it is important to capture their interpretation of certain aspects (like the definition of collaborative learning or the significance of task design for effective collaboration) which could be considered as one of the prime conditions for the effective outcome of collaborative discussions.

In the following account each question is introduced with its rationale, followed by the categorisation applied to the response. In each case the section acting as evidence of the category is italicised. The categories used were:

- **Category of task design: Skill acquisition OR Restructuring of the concept**

- **Teaching belief: The significance of collaborative learning AND/OR The significance of socio-cultural learning**

- **Perception of collaborative learning: socio-cultural OR focus on joint construction of knowledge**

- **Expected learning outcome of collaborative interactions**

- **Conditions of collaborative learning**

- **The approach of facilitation during collaborative discussion**

Appendix 2: Sample interview transcript

- **The measure taken by the tutor to improve participation in collaborative discussion**
- **The possible challenges to facilitate the process of group learning**
- **The tutor's perception to improve the existing practice of discussion based teaching and learning**

For any Case study research, the description of the individual case is important for conceptualising the context of the case; for example, it is important to explore the characteristics as well as the objectives of the course. This information is elicited by the starting question of the interview

1. Tell me something about your course

    Response: This is MA International Development course; it is one of the oldest courses run by the institute through online medium. *It basically tries **to develop a new understanding** among young people who work in International Education and Development primarily in low and middle income countries. The course is geared towards millennium development goal and education for all.* **(Category of task design: Restructuring of the concept)**

For the next two questions it is important to consider the individual perception of the tutor about the pedagogical design that might be helpful for accomplishing the course objective.

2. What kind of pedagogical design do you adopt for this kind of online course?

    Response: In this course, we are driven by the constructivist approach of learning. *The major focus is on learning through interaction where people can construct knowledge from their experiences, from their local knowledge, mainly we emphasise the learning through **collaboration**.* **(Teaching belief: The significance of collaborative learning).**

3. According to your perception what could be the possible strengths of this approach?

> **Response:** *The main advantage of this kind of approach is that they can draw on reflective experience of the existing context of reality. First of all, when people interact through text, they constantly analyse those texts and assess them against their experience and local knowledge and construct their understanding* **(Teaching belief: The significance of socio-cultural learning).**

As the concept of collaborative learning has been differentiated from the mere socio cultural learning by engaging the idea of 'group cognition' therefore it is important to capture 'What is meant by collaborative learning' in terms of the tutor's individual definition.

4. According to your perception what is collaborative learning?

> **Response:** *Any environment where people come together and change their views is a collaborative environment. Collaborative learning means the change in thinking, the change in perception because of the interaction with others, mainly because of the collective sharing of experiences* **(The perception of collaborative learning: Same as socio-cultural learning).**

To get more in-depth view of the interpretation of the collaborative learning by the tutor, the following question has been asked to check whether the objective of course has been targeted to achieve the group outcome or it is just an approach to assess the change in individual cognition due to social interaction.

5. Do you expect any distinctive learning outcome from the collaborative approach?

> **Response:** *No, not as such. The learning outcome of the collaborative approach could* ***be same as any other socio-cultural learning****. In this mechanism, everybody can take away something from the mutual interaction, and the respective change in their perception or understanding is learning* **(Expected learning outcome of collaborative interactions: Same as socio-cultural learning, learning outcome is limited to individual epistemology).**

Appendix 2: Sample interview transcript

Here, it is important to consider what are the different conditions has been taken into attention while designing the practice environment to facilitate the collaborative approach. In fact the answer could reveal one more time, how collaboration has been conceptualised by the tutor especially in terms of individual achievement vs. group achievement.

6. What are the conditions (or factors) you have to take into your consideration to make collaborative learning successful?

> **Response:** *Mainly you have to think about* **structured activities** *and* **good facilitation** **(Conditions of collaborative learning: Structured activities and good facilitation).**

Here, it is important to comprehend the term 'facilitation' which could be reflected through the individual tutor's view on his/her role in the collaborative discussion forum.

7. In terms of your perspective what would be the tutor's role in the effective collaborative discussion?

> **Response:** *The tutor's role mainly would be the orchestration or oil the wheel of the group* **(The approach of facilitation: Managing the dynamics of group interaction).** *It is always better to encourage the participants to contribute more in a critical and analytical way* **(The approach of facilitation: Encourage the participants for effective engagement).** *In* terms of my perception, *the deconstruction of a previous assumption is the most constructive part of learning. And to achieve that learning outcome, it is important for every individual to consider the different viewpoints of others. Therefore I always encourage everybody to present their viewpoint during the discussion* **(The approach of facilitation: Creating and maintaining the learning environment for mutual negotiation).**

There should be concern in terms of how the tutor ensures the maximum participation in the collaborative discussion.

8. How can you ensure the maximum participation in the collaborative discussion?

> **Response:** I have no doubt that if we have a bunch of 20 participants, who are extremely interested and engaged in their professional fields, and then probably they are the ideal one for collaborative discussion. However, very often I observe the acute lack of involvement. *Therefore, most of the cases rather than oiling the wheel, I have to drive the group and even make threats some time* **(The measure taken by the tutor to improve participation).**

If the collaborative discussion has been conceptualised as the similar approach of mere socio-cultural learning (as it has been conceptualised by the tutor), still there could be other possible challenges to accomplish the process.

9. What could be the possible challenges of the collaborative approach?

> **Response:** *In collaboration we adopt horizontal leveling effect of learning. However, some people still believe that hierarchical view of knowledge and authority is still better; therefore they try to respect the view of certain people more valid than others* (**Possible challenges to facilitate the process of group learning: Participants orientation towards authoritative learning).** *Therefore, developing the learning space where power could be distributed in a more equitable platform is a big challenge in the existing scenario* **(Possible challenges to facilitate the process of group learning: The challenge to establish a democratic learning environment with equal distribution of power**

The next question is also meant for to understand what specific measures have to be taken by the institutions to facilitate the new approach of teaching and learning through social interaction.

10. According to your perception what could be done to improve the current scenario?

Response: *The improvement of existing online pedagogy is not much of a central policy. The needs for a central Institutional Policy, the support system for developing this kind of course or the significance of staff development programme are not well conceptualized in my view* **(Suggestion to improve the existing practice: The significance of Institutional role).** *There is a need for action research where the tutors can do research to improve their practice. There should be systematic approach through which a community of tutors can share their experiences and challenges of online learning. Whatever is happening today is an isolated fragmented operation, not centrally co-ordinated* **(Suggestion to improve the existing practice: The significance of action research by the practioners).**

The responses of the questions 9 and 10 can provide immense insight in terms of the implication of this research, especially to highlight the **role of tutor** and the **role of the Institutions** in facilitating the new approach of teaching and learning through collaboration.

Appendix 3: Sample content analysis transcript

Collection: Activity3, group4 (Case Study two: Development Education)

Each message as a unit of analysis has been identified (the specific indicators under all major categories has used for identification, the detailed description has been provided in Chapter five), and categorised according to the six different phases of the collaborative process.

Authors of postings are identified by initials only. Similarly, specific indicators have been used to express the characteristic of the messages, for example as proposed in Chapter five; the symbolic representation of IV represents the categorisation as 'articulating individual perspectives'; PA, 'accommodating the perspectives of others'; CA, 'co-constructing shared perspectives' etc). In each case the quote is categorised and then interpreted for its pedagogical significance in relation to the theory.

Thread: towards the final diagram
Post: RE:RE:RE:RE:RE:RE: towards the final diagram   **Final post**
Author: Sa

Hi guys (applicable to both gender) ,**(Social presence, S)**

Both diagram and rationale get a resounding yea from me! **(Practice level discussion, BW; The agreement after accommodating the views of others on the practice, PA)**

Thanks to all for being such a great and supportive group.**(Social presence, S)**

I do feel we have achieved something special here, not just in our wonderful planetary system, but also in learning how to work together in this way, and as you say T, in listening to one another! **(Social presence, S).**

Well done us... Prosecco all round I say. **(Social presence, S).**

Sa

Reply Quote Mark as Read

Thread: towards the final diagram
Post: RE:RE:RE:RE:RE: towards the final diagram

Author: T

Absolutely. I will do that now.**(Organisational level discussion, BW)**

I can see my ideas in there and that is great to see that they are not only included but that they were listened to so thanks for that – N and Sa, for doing that and writing it so well. **(Social presence, S)**

I really loved the point about how the dancers only have a partial view, and how this view differs depending on where you are on the dance floor, and it is dancing with each other .**(Practice level discussion, BW; Accommodating the perspectives of others by direct agreement, PA)**

I will delete that photo and retrieve the big red planet and then post both tonight it I get a yeh from all.**(Organisational level discussion, BW)**

It has been a long activity this one, from the 'battle at athens', to the 'many fiddling with word', and ending with the REs, we have come a long way but we got there with a pretty impressive piece of work to show for it- but most importantly I have learnt a lot, and I don't think I will forget it any time soon. Thank you.**(Social presence, S)**

T

Reply Quote Mark as Read

Thread: towards the final diagram
Post: RE:RE:RE:RE: towards the final diagram
Author: S

OOOPS, the big red planet, it must have been lost when I cut out the sun, now I have a problem to put it back, if I try to put it in, it covers everything else,**(Social presence, S).**

T, can you do that, putting something behind? **(Organisational level discussion, BW)**

Sorry! **(Social presence, S)**

S

Reply Quote Mark as Read

┌─ **Thread:** towards the final diagram
   Post: RE:RE:RE: towards the final diagram
   Author: T

Hey S and everyone **(Social presence, S)**

I think that stray picture was hiding behind the big red planet that was there originally and now that that is gone, the picture is there - I think it was lost in all the technical movements I was making yesterday (was it yesterday? i am losing all sense of time!)- it was the one that got away! **(Practice level discussion, BW; Responding to question, CR)**

T

Reply Quote Mark as Read

┌─ **Thread:** towards the final diagram
   Post: RE:RE: towards the final diagram
   Author: S

Hey all,**(Social presence, S)**

Yes the picture inside. I am also not sure who placed it, T? **(Practice level discussion, BW; Asking for clarification, CA).**

If you had a reason, leave it, otherwise take it out,**(Organisational level discussion, BW)**

Sa, thanks all you guys (intercultural learning - "guys" can also be applied for women?) for the great rationale. **(Social presence, S)**

S

Reply Quote Mark as Read

┌─ **Thread:** WOW!
   Post: RE:RE: WOW!
   Author: Sa

Hello all,**(Social presence, S)**

T, I have just posted the updated version of the rationale in the last thread – **(Organisational level discussion, BW)**

Don't want you to miss it! **(Practice level discussion, BW; Soliciting feedback, CF)**

Sa

Reply Quote Mark as Read

Thread: towards the final diagram
Post: RE: towards the final diagram
Author: Sa
Attachment: Education for Transformation Metaphor - group rationale.doc (24.5 Kb)

Hi guys,**(Social presence, S)**

I have attached the rationale with suggested changes **(Another version of shared artefact; group rationale, AD)**

Will check again in about half an hour to see if there has been any more discussion. I won't be able to get on-line tomorrow though so am happy for you guys to submit this as soon as you think it is ready!   Well done all for burning the midnight oil on this one - aren't we dedicated! **(Social presence, S)**

Sa

Reply Quote Mark as Read

Thread: WOW!
Post: RE:WOW!
Author: S

Appendix 3: Sample content analysis transcript

Hey T, N and Sa, **(Social presence, S)**

T, please the diagram is waiting for you as well. **(Practice level discussion, BW; Soliciting feedback, CF)**

I think I will go home and open a bottle of Prosecco to celebrate us ...**(Social presence, S)**

S

Reply Quote Mark as Read

Thread: WOW!
Post: WOW!
Author: T

Hey all **(Social presence, S)**

WOW! I am just in from work and shattered, its been a long two days, but WOW I am impressed at the amount of conversation that has been going on, even over the past hour.**(Social presence, S)**

I agree we should post tonight if we can.**(Organisational level discussion, BW)**

thanks everyone for all the work **(Social presence, S)**

T

Reply Quote Mark as Read

Thread: towards the final diagram
Post: towards the final diagram
Author: S
Attachment: Diagram_Group4.doc (2.313 Mb)

There you go ... (Another version of shared artefact, group diagram, version, 5, AD). feel free to wish changes, **(Practice level discussion, BW, Soliciting feedback, CF)**

I will work over time, if it is necessary ;-) **(Social presence, S)**

S

Reply Quote Mark as Read

Thread: By way of an explanation
Post: RE:RE:RE:RE:RE: By way of an explanation
Author: Sa

Hee hee. **(Social presence, S)**

will incorporate suggested changes into rationale and **(Organisational level discussion, BW)**

Reply Quote Mark as Read

Thread: By way of an explanation
Post: RE:RE:RE:RE:RE:RE:RE: By way of an explanation
Author: S

"rofl" **(Social presence, S)**

Reply Quote Mark as Read

Thread: By way of an explanation
Post: RE:RE:RE:RE:RE:RE: By way of an explanation
Author: N

Ha Ha! **(Social presence, S)**

Reply Quote Mark as Read

Thread: By way of an explanation
Post: RE:RE:RE:RE:RE: By way of an explanation
Author: S

Appendix 3: Sample content analysis transcript

this mail is just to work on the number of postings, (**Social presence, S**)

yes, I will include the global competitiveness planet ...(**Organisational level discussion, BW**)

Reply Quote Mark as Read

⌐ **Thread:** By way of an explanation
  Post: RE:RE:RE:RE: By way of an explanation
  Author: S

o.k. :-) I go ahead ...(**Practice level discussion, Accommodating the perspectives of others by direct agreement, PA**)

Reply Quote Mark as Read

⌐ **Thread:** By way of an explanation
  Post: RE:RE:RE:RE: By way of an explanation
  Author: N

Hi **(Social presence, S)**

I am happy with the changes to the diagram that you suggest and, **(Practice level discussion, BW; Accommodating the perspectives of others by direct agreement, PA).**

please, go ahead and make the changes.**(Organisational level discussion, BW)**

Interestingly Tricia the bit in my rationale about Global competitiveness education I pulled from your work **(Practice level discussion, BW; Co-constructing through reflecting on the views of others, CCR)**

and no, it hasn't been put on the diagram yet. **(Practice level discussion, BW; Responding to question, CR).**

S could you add it in near to International Education? T please could you insert whatever you want from mine into yours to make it read ok. I really would like to get this done, dusted and posted. **(Organisational level discussion, BW)**

N

Reply Quote Mark as Read

Appendix 3: Sample content analysis transcript

┌─ **Thread:** By way of an explanation
Post: RE:RE:RE: By way of an explanation
Author: Sa

Hi S, T and N,**(Social presence, S)**

I agree with all the changes that you have made to the diagram. Yes to bigger disco ball and yes to children dancing in the north! **(Practice level discussion, BW, Accommodating the perspectives of others by direct agreement, PA)**

So please do go ahead and change the diagram. N, T, where do you want to go with the rationale? **(Organisational level discussion, BW).**

Sa

Reply Quote Mark as Read

┌─ **Thread:** By way of an explanation
Post: RE:RE: By way of an explanation
Author: Sa

Hi N, **(Social presence, S)**

Encouragingly, I think we have come up with fairly similar rationales and have both covered roughly the same points. I also really like your line about the planetary pull and I really like your last paragraph.**(Practice level discussion, BW, Accommodating the perspectives of others by direct agreement, PA)**

Shall we wait and see if the other guys drop in this evening before deciding which rationale to go with? **(Organisational level discussion, BW).**

Sa

Reply Quote Mark as Read

┌─ **Thread:** By way of an explanation
Post: RE:RE: By way of an explanation
Author: S

Hi Sa, T and N, **(Social presence, S)**

I am absolutely thrilled by this process, esp. the way how my diagram became ours, fitting in the viewpoints of all of us. and yes we should definitely get extra credits.**(Social presence, S)**

As for the rationale, I am more than happy with either version (**Organisational level discussion, BW)**

because both you expressed, what I wanted to say, but in a much more sophisticated (positive sense) way + you integrated quotations, some of your ideas and those of the others. **(Practice level discussion, BW; Accommodating the perspectives of others, direct agreement, PA)**

Picture: adults or children, I just took what I had, without reflecting what it could imply. Compromise: finding European children dancing and have 4 different pictures? **(Practice level discussion, BW; Articulation of individual perception about practice, IV).**

Disco ball: Could we draw it a bit larger, to make the facets more visible? **(Practice level discussion; BW, Proposing some alternative suggestion, CE).**

Let me tell you more (just for you, not to be integrate in the rationale)

- about the the backdrop picture: The student chose 4 concentrically (?) circles in the middle, which represent the elements fire - yellow, water – blue, air – dark blue, earth – green and brown. 4 elements = nature/earth to be protected by every one (the hands), showing the cultural diversity of mankind (different colours of the hands). - and about the disco ball: I use a real little disco ball (many facets/global view/ all themes...) and a mirror (one facet/local view/one theme ...) to show how the global is reflected in the local and vice versa, how one theme contains all the others ... that's why I am so happy about our frame, which means the same thing ... **(Practice level discussion, BW; Responding to question, CR).**

Procedure: Should we share the work? I work on the diagram and you go on deciding which rationale we will take? If T shows up, she can decide where to join? I am looking forward to your comments and let's finish that until 10 your time or 11 my time :-) **(Organisational level discussion, BW).**

S

Reply Quote Mark as Read

─ **Thread:** By way of an explanation
Post: RE: By way of an explanation
Author: N

Hi T, Sa and S **(Social presence, S)**

We must be the only group that has come up with two rationales. Do we get extra

points for that? Does it mean we can skip the next activity? (**Social presence, S**)

Really like the way you pulled it together Sa. **(Practice level discussion, BW; Accommodating the perspectives of others, direct agreement, PA).**

You have also grounded your rationale in references far better than I did. **(Social presence, S)**

I am therefore happy to go with your work and let's post it soon! **(Organisational level discussion, BW)**

N

Reply Quote Mark as Read

Thread: By way of an explanation
Post: By way of an explanation
Author: N
Attachment: By way of an explanation.doc (26.5 Kb)

Hi everyone **(Social presence, S)**

Attached is my stab at pulling it all together. **(Version 2 of group rationale, shared artefact, AD)**

Sa, you have made a good point about the photographs but have also come up with a good rationale for using them if we wanted to keep them as they are! **(Practice level discussion, BW; Accommodating the perspective of others, direct agreement, PA)**

Thank you also Sa for your detailed table in earlier posting. **(Social presence, S)**

I have used some of this in the explanation in terms of Global Competitiveness education. **(Practice level discussion, BW; Constructing through reflecting on the views of others, CCR).**

If everyone agrees with this we will have to shift it nearer to International Education on the diagram as you suggest. **(Organisational level discussion, BW)**

See what you all think and go on from there. **(Practice level discussion, BW; Soliciting feedback, CF)**

I really think we should post tonight or early tomorrow. I will be around until 10 tonight (11 o'clock your time S?) There looks like a lot of new reading to do!

Appendix 3: Sample content analysis transcript

(Social presence, S)

N

Reply Quote Mark as Read

┌ **Thread:** new thread
    Post: RE: new thread
    Author: S

Hi, N, hi everyone,**(Social presence, S)**

thanks for the new thread, (Social presence, S)

I am also convinced that we will get there, may be even today. **(Organisational level discussion, BW)**

Its 8.26 pm here, and I will be online until 11.00.**(Social presence, S)**

S

Reply Quote Mark as Read

┌ **Thread:** new thread
    Post: RE:RE: new thread
    Author: Sa
    Attachment: Mali dancers.doc (380.5 Kb)

more pictures of dancers attached should we want to use one of them **(Organisational level discussion, BW)**

Sa

Reply Quote Mark as Read

┌ **Thread:** new thread
    Post: RE: new thread
    Author: Sa
    Attachment: Education for Transformation Metaphor -
    group rationale.doc (23.5 Kb)

Appendix 3: Sample content analysis transcript

Hi T, S and N,(Social presence, S)

I have had a bash at pulling together our ideas and have come up with some sort of a rationale **(Initial version of group rationale, another shared artefact, AD)**

I think you were also looking at pulling something together N, but I guess two heads (or four!) are better than one.**(Organisational level discussion, BW)**

I'm not sure how well I've represented everyone's ideas and have thrown a few of mine into the mix too, so would love to hear your comments. **(Practice level discussion, BW; Soliciting feedback, CF)**

I'm thinking the best thing to do now is to see what else comes to the table this evening and make a plan from there. I think that we are all aware that we are eating into our time for the next activity and that we need to get this wrapped up sometime soon! **(Organisational level discussion, BW)**

I'm a bit wary of representing the voice of the south with a picture of children dancing and the voice of the north with a picture of adults dancing. Do we imply that the voices from the south are infantile? **(Practice level discussion, BW; Asking for clarification, CA).**

Would a picture of adults dancing from the "south" be more appropriate? **(Practice level discussion, BW; Proposing alternative suggestion, CE).**

I will attach (in another post as I don't think we can add more than one attachment?) a few other googled images we could use if we want to change this.**(Organisational level discussion, BW)**

Or is the image of the children dancing included consciously in order to highlight the fact that the voices from the south are not yet fully voiced (or given space) in the debate. **(Practice level discussion, BW; Asking for clarification, CA)**

I will check in again later this evening to see where we are with this.**(Social presence, S)**

Sa

Reply Quote Mark as Read

Thread: new thread
Post: new thread
Author: N

Hi everyone,(Social presence, S)

I am briefly checking in now but am not going to be back on until about 9. Sorry it is so late. We will get there!**(Social presence, S)**

N

Reply Quote Mark as Read

Thread: first draft again with a few slight changes
Post: RE:RE:RE:RE:RE:RE:RE:RE:RE: Final diagram???
Author: S

Hey all, **(Social presence, S)**

Just a sign of life, before I run to a meeting, which will last the whole day. That meeting is about an action plan for ESD in Baden-Württemberg, trying to make it as development-oriented as possible! In the evening I will be available, to contribute towards our posting. **(Social presence, S)**

S

Reply Quote Mark as Read

Thread: first draft again with a few slight changes
Post: RE:RE:RE:RE:RE:RE:RE:RE: Final diagram???
Author: Sa
Attachment: Activity 3 template sally.doc (97 Kb)

Oops. **(Social presence, S)**

Posted that before I was finished. I will be on a train for most of tomorrow morning, so will try and do a bit of pulling together. Will hopefully be back on-line late afternoon. Sleep calls. Speak tomorrow. **(Social presence, S)**

Sally

Reply Quote Mark as Read

Thread: first draft again with a few slight changes
Post: RE:RE:RE:RE: RE:RE:RE: Final diagram???
Author: Sa

Hello there, **(Social presence, S)**

I said I wouldn't throw another diagram into the mix as I didn't want to create more work for everyone at this point. **(Social presence, S)**

However, I am attaching a diagram I used to muddle my way through the various readings (aside from Hicks which I didn't manage to download). Basically, I have pulled out the main aspects of each type of education referred to and put it into a diagram format. This was to help me make sense of it more than anything else. I have roughly grouped the educations according to how I see their connectedness - but haven't made all the links that I see due to the limitations of time and Word! For example I see the 'sustainable development' clump as closely linked to 'global education' but haven't made the connections here.(**(Articulation of individual perspective through the initial submission, IV)**

It's probably easier to say that I feel happy with the way the 'planets' have been arranged in our group diagram (and the 'clumps' in my diagram do show a correlation I think). (**Practice level discussion, BW; Accommodating the perspectives of others, direct agreement, PA)**

One planet that we could add from the readings would be Selby's take on global education as Global Competitiveness Education. I think it would be in orbit somewhere near International Education due to its focus on global competitiveness, its uncritical approach and lack of value base (which would position it fairly far away from the sun that is 'development education'). **(Practice level discussion, BW; Proposing elaboration or extension, CE)**

It occurs to me that this may be what you are referring to with Economic Education though or is this something else? **(Practice level discussion, BW; Asking for clarification, CA)**

Reply Quote Mark as Read

Thread: first draft again with a few slight changes
Post: RE:RE:RE:RE: RE:RE: Final diagram???
Author: Sa

Hi T, **(Social presence, S)**

Sounds like a plan. **(Organisational level discussion, BW)**

I'll be on-line later this evening, then again tomorrow evening. **(Social presence, S)**

Let's get this pulled together! **(Organisational level discussion, BW)**

Appendix 3: Sample content analysis transcript

Thread: first draft again with a few slight changes
Post: RE:RE:RE:RE:RE: Final diagram???
Author: T

Hey Sa and all **(Social presence, S)**

Great to hear from you. I am glad you are okay. I am also glad that you like the diagram. **(Social presence, S).**

Maybe what you could do at this stage is note down a few things to help explain the parts of the diagram that you like particularly the elements of it that fit with your thoughts on this. This will help us draw together the combined rationale. Naomi said that she would write this, but she is busy today, so the more help we can give her on this the better. What do you think? **(Organisational level discussion, BW)**

I realise that we are now in another activity so the quicker we get this finished the better so that we don't get ourselves all backlogged. If we aim to have this completed by tomorrow night, then we can put it to bed). Let me know what you think. **(Organisational level discussion, BW)**

I will be facilitating for the rest of the day so not at a computer so I may get to check in late tonight, I'm thinking it will have to be late tonight as I am pulling a 12hr day tomorrow where I will have no window to check at all, until again late after 10ish. **(Social presence, S).**

Take care (**Social presence, S)**

T

Reply Quote Mark as Read

Thread: first draft again with a few slight changes
Post: RE:RE:RE:RE: Final diagram???
Author: Sa

Hello all, **(Social presence, S)**

So sorry to have been such a weak link this time round. I spent most of my allocated time for this exercise battling with Athens and have been away working in Mull since before the weekend. Had meant to get something posted before I went

but didn't manage to make it. **(Social presence, S)**

I don't want to throw in an entirely new diagram at this point as i don't want to make you guys do any more work in trying to incorporate something totally new. **(Organisational level discussion, BW)**

I really love the diagram as it looks at the moment. **(Practice level discussion, BW; Accommodating the perspectives of others, direct agreement, PA)**

Again, so sorry for being such a dud. It's a shame not to have been able to take part in what seem to have been some really fruitful group discussions. (Social presence, S) and let me know if there is anything in particular I can do to be of use other than feeding in my comments etc on what you guys have done so far. **(Organisational level discussion, BW).**

Sally

Reply Quote Mark as Read

┌─ **Thread:** first draft again with a few slight changes
    Post: RE:RE:RE: Final diagram???
    Author: N

Great Tricia- Thanks. **(Social presence, S)**

I was able to open it this time.**(Social presence, S)**

N

Reply Quote Mark as Read

┌─ **Thread:** first draft again with a few slight changes
    Post: RE:RE: Final diagram???
    Author: T
    Attachment: Diagram4.doc (1.894 Mb)

Hey there N **(Social presence, S)**

Hope this works, I renamed it in case that was the problem, not sure what the story is. **(Organisational level discussion, BW)**

Thank you for being a great group member.**(Social presence, S)**

T

Reply Quote Mark as Read

Appendix 3: Sample content analysis transcript

┌─ **Thread:** first draft again with a few slight changes
│   **Post:** RE: Final diagram???
│   **Author:** N

Hello T, S and Sa **(Social presence, S)**

I need help as i can't open the file. **(Social presence, S).**

It has only been this last week that we have really started getting anywhere with this task and when I have been thinking and learning. However I am conscious of the date and that there is a new activity to focus on. Unfortunately/fortunately it is my son's 10th birthday today and I will not be able to do much this evening. **(Social presence, S)**

N

Reply Quote Mark as Read

┌─ **Thread:** first draft again with a few slight changes
│   **Post:** Final diagram???
│   **Author:** T
│   **Attachment:** Diagram final??.doc (1.894 Mb)

Hey you two **(Social presence, S)**

Great suggestions **(Social presence, S)**

I will go off now and make the changes. **(Organisational level discussion, BW)**

Thanks for the questions and the answers. **(Social presence, S).**

I agree that we should move International education out further as this is what I thought too at the beginning. And I will delete Road safety education and Education for All as I agree with your thinking about that, Education for All is encompassed in Human Rights and many others, so it is more of an aspiration than a theory. **(Practice level discussion, BW; Constructing through reflecting on the views of others, CCR)**

Great idea N, about the arrows between the local and the global as that fits with what I think about them in terms of the ever moving relationship between them as it is not a static thing. And placing the photos there was a good idea too, **(Practice level discussion, BW; Accommodating the perspective of others, direct agreement, PA)**

I have though moved them a little, (O)so that they each sit at a global and a local - as a way of illustrating that our Global is someone else's local and vice versa (another's Global is our local). **(Practice level discussion, BW; Proposing elaboration, CE).**

347

I totally agree with moving antiracist education, peace education and education for inequality all inside HR ed. and Environ education within ESD.**(Practice level discussion, BW; Accommodating the perspectives of others, direct agreement, PA)**

Not sure what to do with Economic Education- this is a very specific type of education, but yet is important in the understanding of the world and the issues that we deal with. So I do think it needs a place somewhere on the diagram – **(Practice level discussion, BW; Articulation of individual perspectives, IV).**

Just not sure where **(Practice level discussion, BW; Asking for clarification, CA).**

I have placed it on the edge of the larger Education for Social Change planet - giving it a place but not too near all the others. What you think? **(Practice level discussion, BW; Soliciting feedback, CF)**

I also think that we need to affirm the education for transformation and education for social change – as you pointed out N they do work towards a combination of the aims of many of the other types of education.**(Practice level discussion, BW; Accommodating the perspectives of others, direct agreement, PA)**

So as you had done -I have just highlighted that the larger central planet is Education for social change and I have placed Education for transformation above all, almost as a title that covers all of the planets below –May be this is the name of this planetary system? **(Practice level discussion, BW; Articulation of individual perspective, IV)**

Then I remembered that S's original title was Education for Transformation - so tick, we are all thinking the same on this one. **(Practice level discussion, BW; Accommodating the perspective of others, direct agreement, PA)**

N - I hope I can answer your questions, I think what I understand by educations not fitting together as a negative, is that we all are working for the same goal but focusing on different aspects of that goal, in different guises, so sometimes there can be so many different agendas that often it is forgotten that we are often working without the other. Sometimes this is a result of a different approach or style, or lack of understanding how one needs the other, or as you says Naomi something as practical as competing for funding. Ideally DE does see the broader picture but I suppose there are so many different understandings of what DE is. I think this is something that needs further thought in my mind, I am not sure that I am expressing it well. I think that DE has a lot to offer the other educations for exactly your point in that it tends to be the unifier, I don't think this dilutes, I think ultimately it helps make all of us make sense of the bigger picture and see where all the many many pieces fit together and that essentially it is important that we work together - because with elements missing we don't get any closer to the ultimate goal. **(Practice level discussion, BW; Responding to question, CR).**

Thanks both of you for your help in this – sleep well and I will check in tomorrow -

although I am working until about 11pm tomorrow night so it will be late before I check in at the end of the day –**(Social presence, S)**

T

Reply Quote Mark as Read

┌─ **Thread:** first draft again with a few slight changes
Post: RE:RE:RE:RE: first draft again with a few slight changes
Author: S
Attachment: first draft of combined diagram3.doc (1.047 Mb)

Oh sorry, I forgot to attach ... and oops, **(Social presence, S)**

Thank you! **(Social presence, S)**

S

Reply Quote Mark as Read

┌─ **Thread:** first draft again with a few slight changes
Post: RE:RE:RE:first draft again with a few slight changes
Author: S

Hi T and N, **(Social presence, S)**

Surprise! I got back from my conference sooner than expected! And I was very exhausted, but now you cheered me up, I enjoyed reading your communication, esp. the "breakfast" part in it! To complete it: I did not have "Frühstück im Bett :-)))" on Sunday, but I will try to introduce that, learning from you! Intercultural Education! Thank you! Your work! Another great big thank you! **(Social presence, S).**

I like the changes you made, Tricia! Esp. the frame! And also the re-grouping of the planets makes sense to me.**(Practice level discussion, BW; Accommodating the views of others, direct agreement, PA)**

I only have a few suggestions (see the attachment) **(Practice level discussion, BW; Proposing   elaboration,   PEE)**

- International Education a bit further away from the others (to express, what N said about it) **(Practice level discussion, BW; Articulation of individual views on the practice, IV).**

Should we cut out road safety education?**(Practice level discussion, BW; Soliciting feedback, CF)**

I only put it, because in Germany ESD tries to include everything, even this, strange, isn't it? **(Practice level discussion, BW; Articulation of individual views on practice, IV)**

Should we also cut out economic education? **(Practice level discussion, BW; Soliciting feedback, CF).**

I not sure any more, where I took that from (probably because I wanted to show, that ESD tries to integrate economic, ecological and social aspects) **(Practice level discussion, BW; Articulation of individual views on the practice, IV)**

Finally, Naomi - you asked, what "education for all" is - what I meant was Millennium Goal 2, quality education for all children in the world, which is part of the definition for ESD (in a worldwide context) –**(Practice level discussion, BW; Responding to question, CR)**

but now that I think of it, it is a vision or an aim, and not an educational concept, **(Practice level discussion, BW; Constructing through reflecting on the views of others, CCR)**

T, could you make the final changes according my and N's ideas? **(Organisational level discussion, BW).**

I have already made slight changes in the diagram just to add the input from our discussion. **(The shared artefact version, 4, AD)**

Love **(Social presence, S).**

S

Reply Quote Mark as Read

Thread: first draft again with a few slight changes
Post: RE:RE:RE:first draft again with a few slight changes
Author: N
Attachment: NP draft of combined diagram2.doc (1.84 Mb)

Dear T **(Social presence, S)**

Thank you for this work. **(Social presence, S)**

(Social presence, S)

I agree fully, with what you said **(Organisational level discussion, BW)**

I will check on you all later during the day, We are a great team,**(Social presence, S)**

I love it.**(Social presence, S)**

S

Reply Quote Mark as Read

┌ **Thread:** group work
Post: RE: group work
Author: T

Hey All **(Social presence, S)**

Thanks for that S- that has really helped in terms of what we do next,**(Social presence, S)**

I am happy with whatever diagram we take, but I suppose it is making a decision,**(Organisational level discussion, BW)**

I am still ok with mine, so if it is the choice, that's great, and I am very open to adjustments to reflect everyone's position, if we can,**(Organisational level discussion, BW)**

but I sense that we are all quite similar in this regard – and **(Accommodating the perspectives of others, agreement, PA)**

I am open to hearing more about what people think about this **(Soliciting feedback, CF)**

as I am learning so much about DE and its place and I can think of no better people to learn from then all of you. **(Social presence, S)**

Or we can go with S diagram, I would be happy with either. **(Organisational level discussion, BW)**

I am having a crazy weekend, with my little girls 3rd birthday party today and then with my Mum around for this and it being the day that it is tomorrow, Mothers day, I fear I will not get online to much later in the day tomorrow. (I usually don't buy into over marketing of 'special days' but I am secretly hoping for that surprise gift and breakfast in bed!!) I realise that I am the facilitator to pull this together so

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I agree with you about the interconnectedness and**(Practice level discussion, BW; The agreement after accommodating the views of others on the practice, PA)**

wonder if we should go further and place Anti Racist Education and Peace Education and Education for Inequality INSIDE Human Rights Education. Similarly how about placing Environmental Education INSIDE ESD? **(Practice level discussion, BW; Proposing some alternative suggestions, CE)**

What do you understand by Education for All? Is this also part of Human Rights Education? Does Education for Social Change cover DE? Indeed does it cover all education? **(Practice level discussion, BW; Asking for clarification, CA)**

Education for social change website states "education is the driver for positive social change, allowing people to participate in society, stand up for their rights, challenge the causes of inequality and live better lives." **(Practice level Discussion, BW; Sharing information resources, CIR)**

International Education could be more isolated still and not connecting. Is it related to Human Rights and Anti Racist Education at all? What is EE? **(Practice level discussion, BW; Asking for clarification, CA)**

Economic Education and Road Safety Education may be placed near to local How about having arrows on the lines connecting the global and local boxes? I see the linking of local and global issues as fundamental to DE which after all we have placed in the centre. Should the photos be moved towards the global and local boxes. **(Practice level discussion, BW; Proposing some alternative suggestions, CE)**

How can it be a negative if the educations don't understand how they fit together.**(Practice level discussion, BW; Inviting thought and discussion, CP)**

I would appreciate your thoughts on this. **(Practice level discussion, BW; Soliciting feedback, CF)**

I do think that one of our strengths in DE is that we see the broader picture and certainly in my organisation we have to work in partnership with other organisations due to our lack of capacity. But does this make DE too accommodating to the agendas of others? Does it dilute the DE process? **(Practice level discussion, BW; Inviting thought and discussion, CP).**

I have put these ideas on an adaptation of the diagram. **(The shared artefact, version 3, AD)**

Please comment!**(Practice level discussion, BW; Soliciting feedback, CF)**

N

Reply Quote Mark as Read

┌─ **Thread:** first draft again with a few slight changes
Post: RE:RE: first draft again with a few slight changes
Author: T
Attachment: first draft of combined diagram2.doc (1.047 Mb)

Ah, I thought I had pasted it into that document, sorry.   Here it is.**(Social presence, S)**

T

Reply Quote Mark as Read

┌─ **Thread:** first draft again with a few slight changes
Post: RE: first draft again with a few slight changes
Author: N

T, **(Social presence, S)**

Did you change the diagram in your most recent email? I can only find the explanation and wonder if I am missing something?**(Social presence, S)**

N

Reply Quote Mark as Read

┌─ **Thread:** first draft again with a few slight changes
Post: RE: first draft again with a few slight changes
Author: N

Hi T **(Social presence, S)**

Just seen your posting. Will have a good look at it this evening and be online to comment probably about 8.30.**(Social presence, S)**

N

Reply Quote Mark as Read

┌─ **Thread:** first draft again with a few slight changes
Post: first draft again with a few slight changes
Author: T
Attachment: Thoughts on placement of the planets.doc (24.5 Kb)

Hey **(Social presence, S)**

I made a few changes to the first draft not much and added a little (not academic) explanation for some of the moves. **(Shared artefact, version 2, AD)**

T

Reply Quote Mark as Read

Thread: First draft
Post: First draft
Author: T
Attachment: first draft of combined diagram (1.046 Mb)

Hey there **(Social presence, S)**

Here is my first attempt to gather our diagrams into one - not an easy task. Let me know how you think it is coming on and what other moves I need to make in order to get it as close as possible. **(The production of the initial shared artefact, version 1, AD)**

Thanks **(Social presence, S)**

T

Reply Quote Mark as Read

Thread: group work
Post: RE: group work
Author: N

Dear T **(Social presence, S)**

Sorry to hear about the lack of breakfast!**(Social presence, S)**

I hope we haven't set ourselves up for too hard a challenge to combine your ideas of the interconnectedness of the different elements, and how these overlap and interrelate onto S's plan. Shout out if it proves too difficult and we can rethink. I will wait until you have posted up your creation and will check every 12 hours or so. Please jot down any thoughts you have had regarding why things are where you have put them. **(Organisational level discussion, BW)**

N

Reply Quote Mark as Read

┌─ **Thread:** group work
    Post: RE: N's response to group work
    Author: T

Hey N, S and Sa (S)

That's great N lets go with S's diagram. As you suggested, I would also like to show that this is all encapsulated within Education for Transformation and the local and the Global circle. Let me know what you would like to see specifically and Also are there other 'planets' you would like to add in? or move drastically? Keep in same place, beside others? (O) Then hopefully by tomorrow evening I should have a revised diagram reflecting everyone's ideas ready for everyone to check over and agree. (**A strategic proposal for working together towards a shared goal, BW**)

I will be on tomorrow afternoon sometime, around about nap time. Never did get that breakfast in bed, in fact didn't even get breakfast! But did have a nice lunch. (**Social presence, S**)

T

Reply Quote Mark as Read

┌─ **Thread:** group work
    Post: N's response to group work
    Author: N

Hello everyone. (**Social presence, S**)

I'm back on-line having been to London for work. Went to a presentation by Vanessa Andreotti which was really interesting but challenging to my brain!(**Social presence, S**)

Brilliant diagrams presented so far by S and T. Far more visually effective than mine. (**Social presence, S**)

I really liked the picture backgrounds Sigi. You have talented students. I like the idea of the planets with the size, colour and position of the planet each reflecting differing factors. I also liked the unnamed planet, what is 'education for all'?(**Accommodating the views of others, agreement, PA**)

From my point of view the disadvantage of S's representation is that it does not

---

explicitly indicate the linkages between the different planets and how much their dances overlap? Don't you think it is necessary to think about all these links ?**(Inviting thought and discussion, CP)**

I guess I am suggesting we try to draw a ceilidh! I don't know the German name for a ceilidh. (A sort of country dance where you move around the room dancing with most of the other participants). **(Proposing alternative suggestion, CE)**

T's diagram shows the interconnectedness between the different concepts. This understanding of the connections is one of the strengths of DE in that in our local practice we are (apparently uniquely) frequently able to see the links between different concepts and how the concepts are able to complement each other. **(Accommodating the views of others, agreement, PA)**

T's unnamed circles also indicate the lack of exclusiveness. T, why are Global Dimension and International Education at the bottom? Are they excluded from the circular relationship? **(Exploring the theory or concept, asking for clarification/elaboration, CA)**

I certainly saw International education as separate, as I explained on my diagram. **(Articulation of individual perspective, IV)**

My proposition is that we try to adapt S's diagram as this provides a place for un/less connected concepts but it would need to be adapted to demonstrate some interrelationships. This happens with planet doesn't it? Our tides are a result of the moon's gravity! However S is offline now until Wednesday. If this is so it gives us the opportunity to use the DE centred diagram that is Tricia's, which is better as showing the interconnectedness. **(Organisational level discussion, BW)**

As I have shown myself to be by far the least adept at creating on Word I will not volunteer to adapt which ever diagram is selected but am happy to work on the explanation. I will next log on tomorrow evening and see what everyone's response is. Hope you got breakfast in bed T; did you get Frühstück im Bett S? I did but had already left bed and had to return!**(Social presence, S)**

Bye N

Reply Quote Mark as Read

Thread: group work
Post: RE: group work
Author: S

Hi T **(Social presence, S)**

hope, you had all what you wanted for breakfast, and have a nice birthday party.

please forgive me if I am a little delayed in gathering all our ideas into one. **(Social presence, S)**

But with S suggestions it does help make this part of the activity a very equitable one.**(Organisational level discussion, BW)**

We will wait to hear from Sa and N and whatever turns out to be the majority vote re the diagram then we will go with that and then hand in hand (thanks S) try and ensure that the elements of each others rationale are included in the explanation. Then if I have left anything out or missed the point completely, you can let me know. **(Organisational level discussion, BW)**

I do think however that so far we are hitting similar reasoning. so that is a good start.**(Accommodating the perspectives of others, agreement, PA)**

Have a lovely night all **(Social presence, S).**

T

Reply Quote Mark as Read

Thread: group work
Post: group work
Author: S

Hey Ladies, **(Social presence, S)**

Thanks for all your contributions , it is so interesting and exciting, how everyone solved the task in a very creative and personal way. **(Social presence, S)**

T:
1. Our course deals with development education, therefore the diagram of T seems to be very appropriate, placing DE in the centre. **(Accommodating the views of others, agreement, PA)**

2. It is embedded in Education for Transformation and a global/local focus, both foci should never 'walk alone', I like that. **(Accommodating the views of others, agreement, PA)**

N:
I like the preliminary exploration, which explains the connection between Global Citizenship (a term, which the Germans don't focus on, interesting to me - what does this tell us about our society???), Global Dimension (which I know mainly from the concepts of global Education) and Human Rights Education. I share the

arguments, which lead put International Education separately. (**Accommodating the views of others, PA)**

S:
In mine I tried to be an observer for outside, and in my 'planetary system' I was influenced by the real situation Germany (not how I would like it to be), **(Articulation of individual perspectives, IV)**

therefore if mine should be the basis, we would have to change the positions of some planets, according to your views. **(Organisational level discussion, BW)**

In which direction do we go?

1. I suggest, that we decide, which diagram we take (if it is mine, like T suggested, I am ready to work on it), but I would also be happy with any of the others. **(Organisational level discussion, BW)**

2. Then we should integrate important view points of the others and modify, hand in hand with creating 500 words to explain it (taking in the elements of our 'rationales'). **(Organisational level discussion, BW)**

I am online tomorrow, Sunday, during the day, you may decide when. Unfortunately, Monday – Wednesday morning I will be absorbed by my work, so anything, which is still to be decided would be up to you and I give you my blanco o.k.**! (Social presence, S)**

Have a good weekend in balancing family, work and relaxing!**(Social presence, S)**

S

Reply Quote Mark as Read

┌ **Thread:** My thinking and diagram
Post: My thinking and diagram
Author: T
Attachment: TriciasDiagramactivity3PP.doc (34 Kb)

Here it is at last. **(Articulating individual views by submitting the initial postings, IV)**

T

Reply Quote Mark as Read

> **Thread:** Thanks
> **Post:** Thanks
> **Author:** T

Hey there **(Social presence, S)**

Thanks for your submissions,**(Social presence, S)**

I too have not been able to access the Athens documents, so I ask for your understanding when looking at my submission.**(Social presence, S)**

S I love your metaphor and you have really helped make something quite complex make sense in a very visual way - I love working in visuals, it helps me understand multilayer topics such as this a lot better. (**Accommodating the view of others, agreement, PA)**

I also really liked how N pointed out that DE is very much about the process and perhaps more so than others, yet it is a process that can be employed by all the other educations, and in fact I would state that not to have this process as the foundation of many of the others surely contradicts what the education is aiming for. **(Accommodating the view of others, agreement, PA).**

Also I like how N also distinguished International Education as something separate from the others as it looks at parts instead of the whole. **(Accommodating the view of others, agreement, PA)**

What does everyone else think on this point? and also on Education for equality? **(Co-constructing shared perspectives by soliciting feedback, CF)**

Once everyone has had an opportunity to read and digest each others work, and make comment, then we will agree a template and content for our combined document - my suggestion is that we use S idea as it really does help illustrate the connections. **(Organisational level discussion, BW,)**

I will take some more time to digest it all a little more and **(Social presence, S)**

see if there are elements that I would want included, moved around, left the same or changed, **(Organisational level discussion, BW)** and

I would love to hear everyone else's comments and suggestions on this so that we can agree a common diagram. **(Organisational level discussion, BW)**

Looking forward to your thoughts **(Co-constructing shared perspectives by soliciting feedback, CF)**

T

Appendix 3: Sample content analysis transcript

Thread: Activity 3 Contribution
Post: Activity 3 Contribution
Author: N
Attachment: Activity 3 N.doc (42 Kb)

Hello everyone **(Social presence, S)**

I have not completed the readings yet. I am still not able to access athens.**(Social presence, S)**

I have however started to put together thoughts about the activity and attach it here.**(Articulating individual views by submitting the initial posting, IV)**

I am now offline until probably Sunday by which time I hope to have finished readings and be able to contribute more **(Social presence, S).**

N

Thread: Grrr
Post: RE: Grrr
Author: S

Dear N, **(Social presence, S)**

Sympathies, empathies from my side, **(Social presence, S)**

S

Thread: activity 3 contribution
Post: RE: activity 3 contribution
Author: S
Attachment: Activity 3 S_rat.doc (31 Kb)

... and the rest ..**(Articulating individual views by submitting the initial postings, IV)**

have a nice day and "bis bald"**(Social presence, S)**

S

Reply Quote Mark as Read

⌐ **Thread:** activity 3 contribution   12
Post: <u>RE: activity 3 contribution</u>
Author: S
Attachment: <u>Activity 3 S_alt.doc</u> (1.047 Mb)

... and the next diagram ... **(Articulating individual views by submitting the initial postings, IV)**

Reply Quote Mark as Read

⌐ **Thread:** activity 3 contribution
Post: <u>activity 3 contribution</u>
Author: S
Attachment: <u>Activity 3 S.doc</u> (938.5 Kb)

Hi all, **(Social presence, S)**

uff, I am so happy, because I put an end to my diagram and text. **(Social presence, S)**

Please find my first diagram in the attachment.**(Articulating individual views by submitting the initial posting, IV)**

Cheers**(Social presence, S)**

S

Reply Quote Mark as Read

⌐ **Thread:** Grrr
Post: <u>Grrr</u>
Author: N

Appendix 3: Sample content analysis transcript

I am getting so cross with this Athens stuff.(**Social presence, S**)

Having spent my work time on Saturday trying to simply access the articles, Kathryn, Hilaire and I have spent more fruitless hours trying to work out to navigate the relevant pages. Anyone recommend a good MA module in how to study on-line?! (that is a joke- I don't need any more studying demands).(**Social presence, S**)

Reply Quote Mark as Read

┌ **Thread:** hey all - tomorrow I hope!
Post: hey all - tomorrow I hope!
Author: T

Hey all **(Social presence, S)**

Me again - I have been out of the loop this week, so **(Social presence, S)**

will try my best to get my diagram up by tomorrow evening, so fingers crossed.**(Social presence, S)**

Each week I seem to have a crazy busy week, and then the next week comes around and its even busier! one day I'll get the balance right.**(Social presence, S)**

Hope you are all well,**(Social presence, S)**

take care **(Social presence, S)**

T

Reply Quote Mark as Read

┌ **Thread:** athens texts
Post: RE:RE: athens texts
Author: S

Ladies, **(Social presence, S)**

please, if any one of you succeeds to get the access to Athens, please, share these articles, I will also give it another trial, but at the moment I work with what I have,**(Social presence, S)**

and I will try to start on my diagram today, posting it as soon as possible.**(Social presence, S)**

Hard, because the sun is brilliantly shining in my garden.**(Social presence, S)**

All the best **(Social presence, S)**

S

Reply Quote Mark as Read

Thread: athens texts
Post: RE: athens texts
Author: N

I've had no luck either regarding athens texts. The website is rejecting either my username (with ioe added on front as advised) or password or both. I've emailed the library help desk for help/advice. **(Social presence, S)**

N

Reply Quote Mark as Read

Thread: athens texts
Post: RE: athens texts
Author: S

Hello all,**(Social presence, S)**

And to me!!! I have the same problem ...**(Social presence, S)**

Thanks **(Social presence, S)**

S

Reply Quote Mark as Read

Thread: athens texts
Post: athens texts
Author: Sa

Appendix 3: Sample content analysis transcript

Hello all,**(Social presence, S)**

Has anyone managed to access the athens texts? **(Social presence, S)**

I am having trouble accessing my account. I'm getting on with the activity using the other texts whilst trying to get this sorted out but if anyone has managed to get hold of them, do you think you could email them to me? **(Social presence, S)**

Would be a great help!**(Social presence, S)**

Thanks,**(Social presence, S)**

Sa

Reply Quote Mark as Read

Thread: Hey there!
Post: RE:RE:RE: Hey there!
Author: S

Hello T, Sa and N, **(Social presence, S)**

I am glad to be in your group – **(Social presence, S)**

and happy with your strategy T! **(Organisational level discussion, BW)**

I will just finish my learning blog of a. 2 tomorrow (ups) and than I can put my energy in readings, the template and more. **(Social presence, S)**

All the best and take care! **(Social presence, S)**

S

Reply Quote Mark as Read

Thread: Hey there!
Post: RE:RE: Hey there!
Author: N

Hello Tricia, Sally and Sigrid **(Social presence, S)**

Greetings from frozen Sedgefield where the racing was abandoned today due to severe cold. At least this laptop gives off some heat.**(Social presence, S)**

This activity looks interesting **(Social presence, S)**

but it is a bit difficult to comment on as I haven't been able to download the template either.**(Articulation of individual perspectives, IV)**

Unfortunately I will be away until Saturday now but will log on then and see if things are clearer.**(Social presence, S)**

N

Reply Quote Mark as Read

Thread: Hey there!
Post: RE: Hey there!
Author: Sa

Morning T, N and S, **(Social presence, S)**

Hope you are all well.**(Social presence, S)**

I'm looking forward to a task which is a bit more visual this week! **(Social presence, S)**

T, your plan for coordinating this sounds fine to me.**(Organisational level discussion, BW)**

Thanks for taking the lead. **(Social presence, S)**

I am having trouble accessing my Athens account to download the two readings. Is anyone else? I will follow up on this, but in the meantime, if any of you do manage to download the documents, do you think you could upload them in the discussion space or email them to me? **(Social presence, S)**

Would be a great help **(Social presence, S).**

Many thanks and speak soon, **(Social presence, S)**

Sa

Appendix 3: Sample content analysis transcript

⌐ **Thread:** Hey there!
Post: <u>Hey there!</u>   **Starting post**
Author: T

Hey Sa, N and S **(Social presence, S)**

T here, I have been assigned to be the facilitator for this activity. **(Social presence, S)**

I realise that we are all just finishing off on the last activity as it was quite a substantial one.**(Articulation of individual perspective, IV)**

 I am keen to hear what suits you all in terms of pulling this piece together (**Organisational level discussion, BW)**

I look forward to working with you on this one **(Social presence, S)**

I am happy once we have completed our individual diagrams to try and pull it together into a group diagram. **(Organisational level discussion, BW)**

Although someone may have a better strategy than this (**Organisational level discussion, BW)**

if not, I will pull it together and then we can discuss it over the week before posting it so we are all happy with the final submission (**Organisational level discussion, BW)**

Take care **(Social presence, S).**

T

Reply Quote Mark as Read

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