

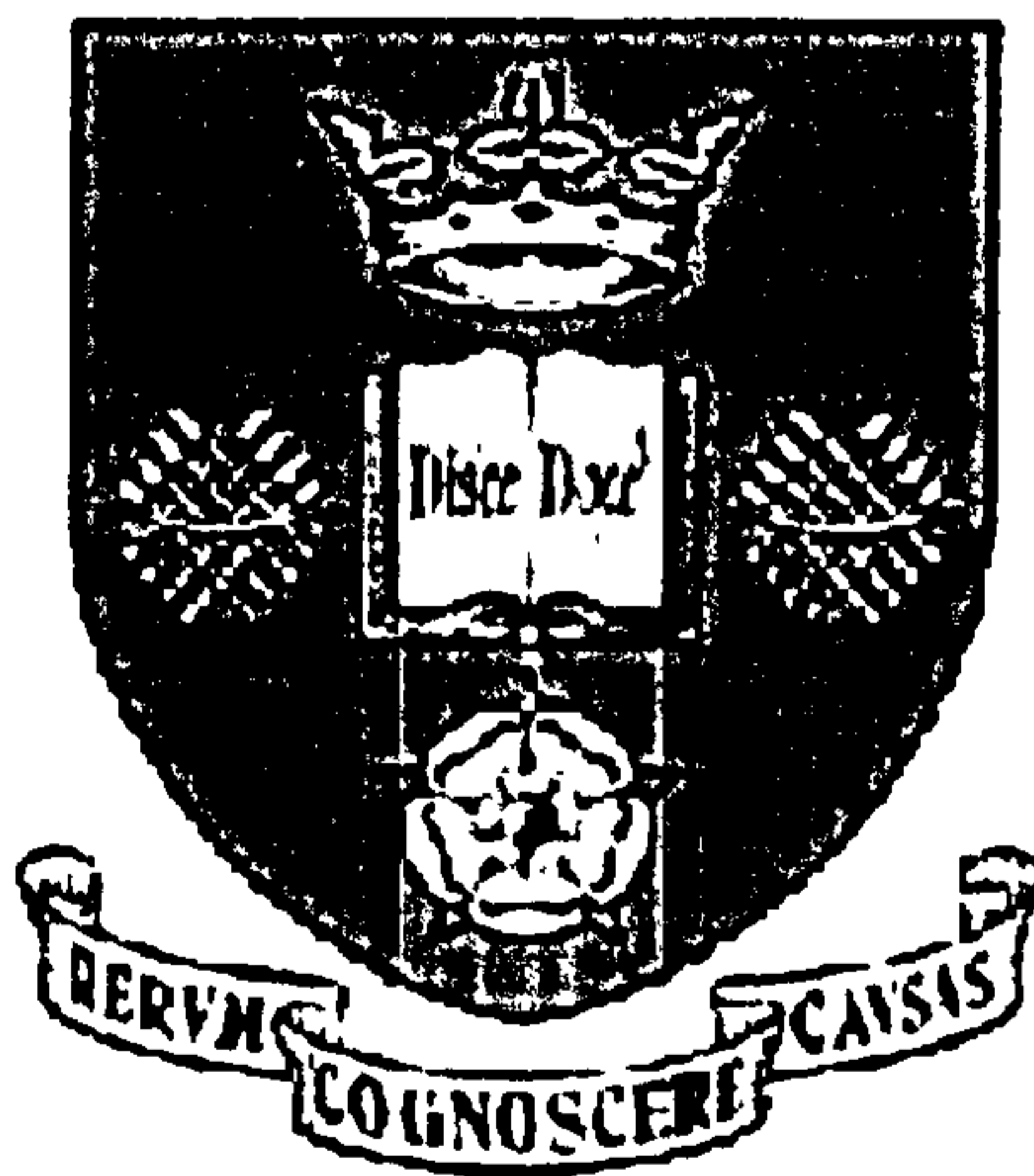
**STUDENTS' PERCEPTIONS OF ISSUES ARISING  
FROM AND FACTORS INFLUENCING GROUP  
INTERACTION IN COMPUTER CONFERENCING:  
A GROUNDED THEORY APPROACH**

by

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Στους γονείς μου Τάκη και Μαίρη

*(To my parents Taki and Mary)*

.....στο Φώτη Μιναρετζή

*"Μόνο με την καρδιά μπορεί να δει κανείς καθαρά, τα σημαντικά δεν τα βλέπεις με τα μάτια".*

*"Τα σημαντικά δεν τα βλέπεις με τα μάτια", επανέλαβε ο μικρός πρίγκιππας, για να σιγουρευτεί ότι δεν θα το ξεχάσει.*

Antoine de Saint-Exupéry, *Ο Μικρός Πρίγκιππας*

.....to Fotis Minaretzis

*"It is only with the heart that one can see rightly; what is essential is invisible to the eye".*

*"What is essential is invisible to the eye", the little prince repeated, so that he would be sure to remember.*

Antoine de Saint-Exupéry, *The Little Prince*

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# **ABSTRACT**

The present study aimed to identify students' perceptions of issues arising from and factors influencing on-line group interaction and dynamics in computer conferencing in higher education by recording the perceptions of a group of students who acted as members of on-line groups. The emergent objectives were to develop recommendations and guidelines for the effective deployment of on-line group interaction and elements of a possible model.

The research has taken an inductive interpretative approach applying qualitative methods. Interviews were the main tool of data collection and the grounded theory approach, as developed by Strauss and Corbin in 1990, adopted for the analysis of the interview data. The analysis was also assisted by the use of the Atlas.ti software, specially designed for analysis of qualitative data. Issues of validity of qualitative research, following Lincoln and Guba's (1985) proposed criteria of establishing "trustworthiness" such as credibility, transferability, dependability and confirmability were addressed and discussed in connection to the current study.

Findings of the study were placed around five main categories addressing ways group participants utilised in order to express themselves in the computer conferencing environment, issues of participation, decision-making procedures, conflicts and disagreements, and finally co-ordination issues. A number of factors affected the categories arose were identified. Relationships between the categories proposed and the code named lack of communication cues were also identified.

Conclusions drawn from the study formulated guidelines and recommendations on computer conferencing issues and factors found to affect interaction among the group participants in the text-based on-line environment and proposed elements of a theory following the grounded theory procedures. Suggestions and points for further research along with implications for practice were also included.

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# **CHAPTER 1:**

## **INTRODUCTION**

# **1. INTRODUCTION**

## **1.1 THE IMPORTANCE OF NETWORK LEARNING IN HIGHER EDUCATION**

Distance learning is a relatively old phenomenon as it began in the 19<sup>th</sup> century providing learners with the opportunity to study from a distance, to access new knowledge and to satisfy the need for accessible learning centres. According to Holmberg (1986) the main characteristic of distance education is the physical separation of teacher and student. A plethora of authors attempted to give their own definition of distance learning. For Keegan (1986) distance education attempts to replace face-to-face teaching and learning processes with communication in which there is a distance between teacher and learner. Garrison and Shale (1987) commented that distance education involves two-way communication between teacher and student in the support of the educational process.

Distance education started in the form of mailed printed materials and expanded later using new technologies such as radio, television, and telephone, to today's telecommunication systems such as FAX, voice mail, e-mail, video and audio conferencing, and computer-based communication (Hoffman, 1995). Moore (1990) supports that the success of the distance education depends on the dialog between the educator and the learner but also on the effectiveness of the communication system. The Open University in Great Britain brought a new vision of distance education as it played an important role in the development of research.

As technology is shrinking the world into a global society and information is radically changing everything, academic institutions should adopt the new changes and adapt new approaches to traditional education and learning. Teaching and learning is changing as institutions also respond to new changing definition of learning. Information technology is, therefore, playing a central role in those changes making it possible to think about new ways of responding to new demands.

Networks can enhance the interactivity among educational departments throughout the world with its major potential and flexibility that provides to its users as collaboration may occur among students in the same classroom or among students in remote classrooms. As connections to the Internet become more commonplace, educators will have the opportunities to integrate collaborative learning techniques with new curricular activity projects and instructional methodologies (Silva & Breauleux, 1994).

Networks can help teachers in a number of ways as through collaborative Internet-based projects educators can:

- enhance their personal productivity,
- support their professional growth,
- continue to learn,
- improve their teaching skills,
- establish network projects and software to support and foster collaborative learning.

From the students' point of view, the Internet-based collaborative learning can provide a number of benefits by:

- bringing a wide range of resources into the classroom,
- inspiring the students with new ideas,
- motivating the learners,
- providing new teaching and learning tools,
- introducing new individual learning styles,
- redefining the role of the student and the teacher into the classroom.

Therefore, network environments has an enormous potential for higher education as:

- expands the classroom resources by making thousands of resources from all over the world available to teachers and students,
- brings into the classroom a huge range of information, data, images, software,
- the connection with world wide sources is instant,
- the universe becomes smaller and the collaboration between different educational institutions throughout the world is now feasible and expected,
- encourages the independence in learning.

Another added advantage the employment of distance education is offering to the higher education institutions is the support of lifelong learning. As Davis (1996) wrote it is time for lifelong learning, from kindergarten to being eighty years old and the main reason for this continuous learning is that the half-life of what a person learns is getting shorter and shorter.



Additionally, Zigerell (1984) suggested "the ease with which modern communications technologies can link educational institutions to homes, work-sites, and community centres has made adult education and lifelong learning matters of national policy" (p.53).

Telecommunication networks are changing the nature of teaching and learning in all aspects of education. Nowhere is this more evident than in the explosion of on-line education, courses offered primarily or entirely through computer mediated communication. There is tremendous need for research results in the computer-based education that help in the successful transition from our current educational systems and instructional methods to the one which can foster lifelong learning in the information society. As Twigg (1996) suggested the emphasis should be not be put on the technology, but on changing in pedagogy enabled by information technology.

The growth of computer-based distance education has a profound effect on the education and lifelong education as modern communication technology links educational institutions to homes, working places, and communities.

## **1.2 COMPUTER-MEDIATED COMMUNICATION AND COLLABORATIVE LEARNING**

Nowadays, different types of computer-mediated communication technologies are widely available in both working and educational environments linking people around the globe. Computer conferencing systems arguably are able to facilitate student-to-student and teacher-to-teacher interaction (Harasim et al., 1995). Additionally, on-line environments using computer conferencing systems can be used as vehicles for collaborative learning (Bump, 1990; Davits, 1988; Riel, 1990a; Riel, 1990b; Riel, 1992), designed to facilitate collaboration among different sizes of groups (Harasim, 1993a). There is a growing body of literature on computer conferencing in both working and educational settings. Harasim et al. (1995) suggest that computer networking can "become the locus of rich and satisfying experiences in collaborative learning, an interactive group knowledge-building process in which the learners actively construct knowledge by formulating ideas into words that are shared with and built upon through the reactions and responses of others" (p. 4).

McConnell (1994) draws our attention to the fact that there is great deal of literature focusing on how people work together in groups. Therefore, as most people have worked in face-to-face groups they tend to approach collaborative learning with a certain degree of familiarity. However, he remarks that working in the on-line group is a totally different experience,

therefore, we should not rely on the experience we have from the face-to-face interaction as little is known "about the experience of working in groups on-line" (McConnell, 1994: 60, 63).

As noted by Gunawardena (1991) "computer conferencing is particularly suited to collaborative learning because the medium facilitates information exchange and provides the shared space essential for group work. Members of a conference can read the same message on the topic, reply to messages that can form chains of communication to be read by all, generate new messages, and share files. One must ask: *How does this new environment promote collaborative learning?* and *How do group dynamics influence peer exchange and collaborative learning?*" (p.17). Therefore, not very much is known about how students interact in computer conferencing and what factors affect this interaction.

On the other hand, when Davie (1987) reported the findings of a CMC course using email, he claimed that he made "no attempt to analyse the experience from a theoretical point of view," because "the phenomenon is new enough that we need some basic sharing of reported data", therefore his work could "begin to provide the base for future analysis and research" (p. 11-12). A year later Davie (1988) stated that "at this stage of development it can be argued that we need a further base of case studies that report the structure of attempts to facilitate adult learning and that report descriptive data on the effects of those facilitative efforts" (p. 58). Additionally, Eastmond (1994) observes the necessity for more studies and research examining on-line learning perspectives from the students' point of view. Thus, there is a lack of qualitative research on the field.

However, although there are a number of studies concerning computer-mediated group behaviour and issues, the majority of them rely on laboratory experiments (Dubrovsky et al., 1991; Poole et al, 1993; Siegel et al., 1986). However, "computer-mediated communication (CMC) has been hailed by distance educators as a medium that can facilitate collaborative or group learning at a distance" and can "provide an additional conferencing feature that supports group and many-to-many communication" (Gunawardena, 1991: 14-15).

Hiltz et al. (1986) proposed that computer-mediated groups could probably encourage different communicative behaviours in comparison to face-to-face groups as conditions are changed and computer-mediated environments are subject to limited information exchange. Walther (1992) points out that most of research and studies concerning computer-mediated communication interactions has been conducted without much background knowledge on previous theories or the establishment of a common framework.

As identified quantitative and experimental studies have taken place in the area. Therefore, there is a need for qualitative data to see interaction in qualitative terms from the students'

point of view. The literature has identified a number of individual dispersed issues and factors affecting on-line group dynamics and interaction in computer conferencing, succeeding occasionally to link certain factors. However, there is not, to our knowledge, a well-developed study on on-line group dynamics. Furthermore, another limitation of computer conferencing and on-line computer interaction research often refers to work environments. Therefore, there is a gap in the literature on how the group dynamics work in on-line educational settings.

This study is designed to address the above issues and the possible gaps in the literature, applying qualitative methods with the intention of seeing on-line group interaction from the students' point of view. The question of how collaborative learning can be promoted as an outcome from using computer-mediated communication still remains a vital one. Indeed, Graham and Scarborough (1999) are stressing the importance for the development of the on-line group dynamics:

“much development of group dynamics and presenting challenging material is still necessary, and although pioneering new fields is difficult for both staff and students, the potential in using CMC is felt to be limited. CMC is more than many other on-line developments, such as teaching on the WWW. The emphasis here is on the interaction- group interaction-and learning as a result of the interaction... The challenge is there- it is up to teachers and students to take it up” (p.46).

## **1.3 THE CURRENT STUDY**

### **1.3.1 AIM**

The aim of the present study was:

- to identify students' perceptions of issues arising from and factors influencing on-line group interaction and dynamics in computer conferencing in higher education.

The aim of the study remained the same throughout the course of the research, although, in keeping with the *Grounded Theory* methodology the objectives and focus changed and developed as interview data was progressively analysed.

### **1.3.2 OBJECTIVES**

- To record the perceptions of a group of students who acted as members of an on-line group

- To determine and describe how they perceived themselves to feel, think and act during on-line group interactions
- To develop recommendations and guidelines for the effective deployment of on-line group interaction
- To develop elements of a model of issues arising from and factors influencing on-line interactions.

During the research I tried to identify what users perceive as the most important factors affecting the process of on-line group working. The present research attempts to combine two different areas, namely education and its implementation through information technology. In other words, students' perceptions of collaborative learning and its dynamics in an on-line environment are dealt with. The existence of the on-line environment differs from a face-to-face situation, as the lack of social cues and physical presence seems to change dramatically the way people act in on-line groups.

Do people change their attitudes when they are on-line in a group? Do they feel more confident? What are their perceptions, ideas, views, opinions of this new on-line group environment? How did they act in their group? What do they perceive as the most important factors that influence their on-line interaction in the group? Do things change in comparison with the face-to-face situation? What would people who now have the experience of working on-line with other people like to improve?

These are questions this research is addressing and is trying to give answers to, or at least make some recommendations and produce the elements of a model that will lead to enhanced functioning within on-line groups.

### **1.3.3 LITERATURE SEARCHES**

According to Joiner et al. (1999) there are three different areas of research focus in the study of computer-supported collaborative learning. The first one considers a number of theories of cognitive development and proposes that social interaction is central for development and research into computer-based collaborative learning. The second focus area is studying the computer-supported collaborative learning trying to provide educational guidelines for the optimal use of the group activity. Finally, the third research area focuses on the design of the computer systems to support collaborative work. A number of computer tools and software have been designed and tested with the aim of supporting collaborative work and researchers have looked at how they can be used in collaborative learning settings (Joiner et al., 1999: 87).

We agree with the categorisation of the computer-supported collaborative learning research as it has been proposed by Joiner (1999). Based on Joiner's (1999) categorisation of research in computer-supported collaborative learning we could identify the focus of our study on the second research area, as it deals with the provision of guidelines and elements of a model for the more effective use of group interaction. Therefore, the literature review presented here will mainly focus on research into this aspect of computer-supported collaborative learning (CSCL).

The aim of the present research is to try to develop elements of a model based on students' perceptions in on-line educational groups. Therefore, it is expected that part of the literature review will rely on the use of CSCL or in other words on computers and mainly electronic communication networks that are used to facilitate the work of collaborative learning groups.

Mabrito (1990) produced an annotated bibliography on resources in computer conferencing and CMC. He divided the bibliography into four different sections reflecting both research and pedagogical trends in CMC. Mabrito's categorisation includes: CMC and Writing Instruction, CMC Distance Education, Social and Psychological Influences of CMC, and Language of CMC. Mabrito's categorisation is an attractive one. However, resources from all sections were used to identify material relevant to the present research. The literature review gained new insights as the analysis of the research data progressed although the main focus remained the on-line group interaction. Five main areas, representing the main categories arising from data, were searched for references including issues of: participation, leadership or moderation, conflicts, decision making, and language use and CMC referring to the text-based nature of computer-mediated communication. All the previous areas were searched keeping in mind the effect of the lack of non-verbal and communication cues.

In the literature review both academic and professional or work research and applications are presented, as it appears that the literature at least in the early years of the 80s is mixing education and working environment applications.

Literature searches were based on a number of different databases (ERIC, Psychological Abstracts, British Educational Index, Current Research in Britain- CRIB, Current Research Worldwide, Social Sciences Citation Index, INSPEC). At the later stages of the study a more focused DIALOG search was performed in order to be able to identify more relevant material to the current study. Additionally, searches on the WWW with the intention of finding on-line articles and material were performed throughout the course of the study.

The factors identified were based on student's perceptions and views that have acted as members of on-line groups using various types of computer conferencing, both synchronous and asynchronous.

In other words, the aim of the present study is to identify students' perceptions on issues arising and factors influencing on-line group interaction and dynamics in computer conferencing in higher education. The factors identified were based on student's perceptions and views that have acted as members of on-line groups using various types of computer conferencing, both synchronous and asynchronous.

The aim of the study remained the same throughout the course of the research, although the objectives and the initial focus changed based on the data emerging from the interviews. In particular, the objectives of the current study were set as to record the perceptions of a group of students who acted as members of an on-line group, to develop recommendations, guidelines and eventually elements of a model of issues arising from and factors influencing on-line interactions.

### **1.3.4 RESEARCH OVERVIEW**

Having introduced the research question and background I would wish now to give a general overview of the chapters included in the present thesis. *Chapter 2* contains the literature review on the topic. This consists of two parts. The first one serves the purpose of providing some general information about face-to-face collaborative learning theories and research. Initially, some explanations and explications of the terms "collaborative" and "co-operative" learning are given followed by the main background theories where collaborative learning arose. There is then an abstractive overview of the methods used in collaborative learning, followed by a short review of research and outcomes found by some leading researchers in collaborative learning research. Finally, an overview of the some theories on face-to-face group dynamics and development is provided. The second part of the literature review is more concentrated and focused on research done on issues and group dynamics in computer conferencing settings. Initially, an introduction is provided along with the definition of some terms used in computer-mediated environments. Then, a more focused literature review follows on issues arose during the interviews and discussed later in the result chapters, including ways of expression in text-based on-line communication, issues of participation, leadership, decision-making and finally conflicts and disagreements.

*Chapter 3* (methodology) addresses the research question along with the aim and objectives of the study. The aim of this chapter is also to provide an introduction to the philosophical perspectives taken into consideration before and during the course of the study and also on the methods applied. The research has taken an inductive interpretative approach applying qualitative methods with the aim of identifying issues of group interaction in computer-mediated communication. Interviews were the main tool of data collection and the grounded

theory approach was adopted for the analysis of the interview data. The analysis was also assisted by the use of the Atlas.ti, software specially designed for analysis of qualitative data. The final part of this chapter addressed issues of validity and reliability of qualitative research, following Lincoln and Guba's (1985) proposed criteria of establishing "trustworthiness" such as credibility, transferability, dependability and confirmability and discussing the current research those in the light of these issues.

Chapters 4 to 8 present the results of the research. *Chapter 4* is concerned with the interview results addressing issues of ways group participants used in order to express themselves in the computer conferencing environment. *Chapter 5* addresses issues of participation, *Chapter 6* is concerned with decision-making procedures in computer-mediated communication, *Chapter 7* addresses the issue of conflicts and disagreements in computer conferencing; and finally *Chapter 8* deals with leadership and co-ordination issues. All result chapters include a final section where the issues arisen from the interviews are discussed in relation to some themes found in the literature. *Chapter 9* includes the identified relationships between the categories and the code named lack of communication cues.

Finally, *Chapter 10* discusses the results presented in the previous chapters in relation to the emergent elements of a possible theory about group dynamics and issues related to text-based computer conferencing. It includes some conclusions drawn from the study, attempting to formulate guidelines and recommendations on computer conferencing issues and factors found to affect the interaction among the group participants in the text-based on-line environment. Suggestions and points for further research are also included.

## **1.4 COMPUTER-MEDIATED COMMUNICATION/ DEFINITION OF TERMS**

Educational computer-mediated communication is an area of practice and research that is expanding in very fast rates. Literature on educational CMC deals with a number of topics such as applications of specific software, course and interface design, interaction, and also educational outcomes. However, before concentrating on specific aspects and facets of group interaction issues and factors influencing this interaction, we perceive important presenting some of the most terms used in our area of study.

## **1.4.1 CMC (COMPUTER MEDIATED COMMUNICATION)**

CMC stands for computer mediated communication, that is referring to the human-to-human communication via computers. This is a broad definition that has been used to describe any communication via computers. According to Santoro (1998) computer mediated communication has been used as a kind of an "umbrella term", including a number of computer conferencing systems. For Jonassen et al. (1995) CMC is the computer network technology used to facilitate communication among "spatially dispersed learners". For December (1997) sees computer-mediated communication as a process of human communication assisted by the use of computers for a variety of purposes.

## **1.4.2 COMPUTER CONFERENCING**

Another term that has been used to describe CMC tools is Computer Conferencing (CC). Computer Conference systems allow people to communicate with each other as a group. Computer conference systems support both synchronous and asynchronous communication within a group.

Harasim et al. (1995) described computer conferencing as:

"a stored transcript of a discussion by a group in easily accessible format. Each conference has access privileges set by the person who opens (creates) the conference, specifying, for example, who can be a member of the conference. Each conference provides a membership list that allows participants to tell who has read what material, so one can know where everyone is in the discussion. Some systems allow people to make changes to their earlier contributions and notify members of any changes. Others are structured to allow different individuals to edit the same contributions or to enter anonymous contributions. Conferencing systems may also allow such functions as various types of voting. In more advanced computer conferencing systems, the person who opens a conference can designate the type of structures and facilities he or she wants to make available in a particular conference. Some systems provide sophisticated information management tools or retrieval capabilities, so the material can be reorganised to reflect different review requirements" (p. 19).

Sudweeks and Allbritton (1996) have produced a very abstractive yet descriptive presentation of terms referring in computer conferencing as shown in the following Table 1.1.



<b>Communication</b>	Communication is a process in which participants create and share information with one another to reach mutual understanding. (Rogers & Kincaid, 1981)
<b>Computer-mediated communication</b>	Computer-mediated communication is human communication between two or more individuals through the use of central computers that store and process message content, and are connected to users in a communication network.
<b>Collaborative communication</b>	Collaborative communication is a process of communication in which participants share in the process of creating meaning and mutual understanding of meaning, in a shared space for a specific purpose. (Schrage, 1990)
<b>Collaborative computer-mediated communication</b>	Collaborative computer-mediated communication is a process of collaborative communication in which participants use computer-mediated communication.

Table 1.1- Term Definitions in Computer Conferencing: Sudweeks & Allbritton, 1996: 4

## Characteristics of Computer Conferencing

Computer Conferencing has the potential to facilitate group interaction providing a unique mode of group communication. Harasim (1990) has pointed out five key attributes of computer conferencing that are: many-to-many communication, place-independence, time-independence, text-based nature of communication, and computer-mediated communication.

- *Many-to-many Communication:* Computer conferencing makes student-to-student interaction easier and set the base for a learner-centred model of group learning.
- *Place Independence:* Computer conferencing provides students with the opportunity to have access to their peers regardless their location.
- *Time Independence:* Self-paced learning is facilitated through computer conferencing. As messages are stored and can be accessed by the learners at any time, students have the time to read, reflect and then reply.
- *Text-based Communication:* Communication in computer conferencing is text-based. The written mode of communication once again promotes reflection, as students are given the opportunity to revise their ideas and structure their arguments.
- *Computer-mediated Learning:* Computer conferencing based on computer mediation gives the students more control over their interaction, as they can save particular items and review them later.

## Synchronous versus Asynchronous

Early in 1980's Toffler has introduced the term of "flexitime":

"It is the computer which has made flextime possible ...it also alters our communications patterns in time, permitting us to access data and exchange it both "synchronously" and "asynchronously"... many time zones apart, each user can choose to send or retrieve data whenever it is most convenient" (p.252)

CMC tools can be classified according to whether they support asynchronous (electronic mail, bulletin boards, Newsgroups of Usenet groups, WWW) or synchronous (real-time) communication (computer conferencing, MOOs -Multiple User Dimension Object Oriented, Web Chats & Internet Relay Chat (IRC), Video-Conferencing). Therefore, interaction in the group can occur at the same time or at different times. Members of the group can also meet in the same place (proximate) or in different places (disperse) (Johansen, 1992).

*Electronic mail (e-mail)* is a system of sending and receiving messages via computers. It uses the Simple Mail Transport Protocol (SMTP) to transport e-mail messages across the Internet. E-mails are sent to individual addresses or through the listserv function to a number of receivers who can be members of a mailing list.

*Discussion Lists or Newsgroups* can post a message on a particular topic, and it will be widely disseminated to a distribution list of subscribers. Newsgroups became quite popular as they can engage the list members into interactive discussions that can include people with special interests from any discipline and area, such as education, philosophy, history, engineering etc.

*Bulletin Boards* serve as electronic message centres where someone can send and review messages sent by other people sharing common interests. Lots of institutions support bulletin boards for student societies, special interest groups, etc.

*World Wide Web* is a networked, graphically oriented, hypermedia system. It uses the hypertext transport protocol (http) and the Hypertext Markup Language (HTML). WWW is a formula that can also support e-mail and Network News.

Synchronous computer communication such as *Chats* and *MOOs* are interactive or real-time systems. Multi-user domains or MUDs are places where people can participate in synchronous chat with more than one person. Therefore, they require all group participants to be on-line at the same time.

Hiltz (1990) conceives asynchronicity to be one of the most important factors in the on-line collaborative environment: "asynchronicity, which may at first seem to be a disadvantage, is the single most important factor in creating a collaborative teaching and learning environment" (p. 41). According to Harasim (1989) asynchronicity is one of the key characteristics of an educational computer-mediated environment, along with independence of place, and the number of participants in an on-line asynchronous interaction.

"Asynchronous collaborative technologies enable "any-time, any place collaboration" providing freedom of time (so learners participate when and if they choose), opportunities to research and backup assertion, more time for reflection, more time to face the intervention. While asynchronous collaborative systems have been more dominant in recent times, especially Internet-based conferencing tools and news groups, they may be more suitable for distance learning than for the face-to-face classroom environment due to their asynchronous character. Synchronous collaborative technologies enable "same-time, same-place" or "same-time, any-place" collaboration providing immediacy, faster planning, problem solving, scheduling and decision making processes. However, the majority of synchronous collaborative tools enable communication (such as text-based chat systems or video conferencing) rather than computer-mediated collaboration" (Marjanovic, 1999).

However, Harasim (1989) also illustrated the importance of the synchronous group communication. For Beckwith (1989) has been mainly associated to problem solving group situation. For Higgins (1991) synchronous interaction is a critical feature of peer interaction and an important component in the developing theories of the social construction of knowledge as they pertain to co-operative learning. On the other hand, asynchronous interaction may be proved to be helpful to improve group problem solving and lead to richer intellectual quality in the communications.

### **1.4.3 GROUPWARE**

The term GroupWare refers to the tools and network environments designed for the facilitation of collaborative learning and they usually support both modes of communication synchronous and asynchronous. It appears that there are three levels of groupware categorisation. As Newman et al. (1997) argue citing Watson (1992) and Briggs & Nunamaker (1994) " first level groupware primarily supports information exchange, and produces shared opinions. So they support group learning, but not necessarily deep learning or critical thinking. It is the task of the teacher to design a learning context that encourages critical thinking when using first level groupware. Second level groupware converts exchanged opinions into a shared understanding of the subject, and shared lists of priorities. Third level groupware goes further, to produce a shared mental model, perhaps as a group causal map. These types of groupware require the participants to think critically and develop in-depth understanding. We need to design second and third level groupware to directly support participants who adopt deep learning strategies, and teaching methods based on course needs, using educational proven group learning techniques" (p.4).

There is quite a large number of GroupWare software available that can be used for group interactions:

- Aspects- Collaborative Writing and Discussion Software,

- CLEO (Collaborative Learning Environment On-line),
- Collaborative Computing Toolkit Series or CCTS,
- Commercial Web Conferencing Software and Free Web Conferencing Software,
- CoVis- Collaboratory Notebook,
- Delphi Planning System (Consensus- building tool),
- Expertchoice,
- GroupSystems (Decision-Support System Software),
- Facilitate.com,
- First Class,
- Lotus Notes,
- MeetingWorks,
- MUDs and MOOs,
- Testbed for Telecollaboration, Four Directions: Electronic Mentoring,
- Virtual U,
- WebGrid

Additionally, the importance of on-line learning environments (VLEs) should be recognised. VLEs are known as learning management tools or on-line environments or collaborative learning software. Most of these systems intend to reproduce the classroom environment and provide learners with new tools to facilitate learning. These environments are offering CMC (computer-mediated communication) facilities, library databases, authoring tools for tutors and administrative tools for the administrators.

Currently, there are a number of VLEs on the market that have been adopted by higher education institutions to facilitate distance learning such as:

WebCT	<a href="http://www.webct.com/">(http://www.webct.com/)</a>
Luvit	<a href="http://www.luvit.com/">(http://www.luvit.com/)</a>
TopClass	<a href="http://www.wbtsystems.com/">(http://www.wbtsystems.com/)</a>
Web Course in Box	<a href="http://www.madduck.com/">(http://www.madduck.com/)</a>
Virtual U	<a href="http://www.vlei.com/">(http://www.vlei.com/)</a>
Assistant, Instructor	<a href="http://home.click2learn.com/">(http://home.click2learn.com/)</a>

Questionmark (<http://www.qmark.com/>)

Blackboard (<http://www.blackboard.com/>)

Further information on the use and evaluation of the specific collaborative software is beyond the scopes of the present study (For more information on the GroupWare see Appendix 2).

#### 1.4.4 CSCL

The main difference between CSCW and CSCL is that the first one is referring to how group IT applications have been used in real organisations and workplace environments. CSCL systems are aiming in primary, post-secondary and higher education environments. There is also the term GroupWare that has been used to describe the products or applications specially designed to support the group work. Hiltz and Turoff (1992) have given a very accurate definition of the term that describes GroupWare as intentional group processes and procedures to achieve specific purposes with the use of software tools designed to support and facilitate group work. However, it is beyond the aims of the current study to review the literature connected to bot CSCW and GroupWare.

According to Wasson (1998) "computer supported collaborative learning (CSCL) is an emerging paradigm for research in educational technology that focuses on the use of information and communications technology (ICT) as a mediational tool within collaborative methods (e.g. peer learning and tutoring, reciprocal teaching, project- or problem-based learning, simulations, games) of learning".

On the other hand, Kumar (1996) argues that "depending on the type of collaborative tasks to perform, CSCL could be employed to address *concept learning*, *problem solving*, and *designing*. Concept learning deals with a goal as a single entity while the other two deal with a goal in terms of sub-goals. Further, *designing* is distinguished from *problem solving* in the sense that the number of solutions in *problem solving* is finite and computationally easier to represent" (p.1).

FACE-TO-FACE COLLABORATIVE LEARNING  
THEORIES AND RESEARCH

COLLABORATIVE VS CO-OPERATIVE LEARNING  
INSTRUCTIONAL DESIGN

## **CHAPTER 2:**

# **LITERATURE REVIEW**

## **2. A REVIEW OF RELATED LITERATURE**

### **2.1 FACE-TO-FACE COLLABORATIVE LEARNING THEORIES AND RESEARCH**

#### **2.1.1 COLLABORATIVE VS CO-OPERATIVE LEARNING: DEFINITION OF TERMS**

Co-operative or collaborative learning is an educational approach that requires students working together in groups to achieve a common goal. A number of terms have been used in the literature to describe the process of working with other people in a group namely "peer collaboration ", "group learning", "co-ordinated learning", "collective learning". However, the two most commonly used terms are "collaborative" and "co-operative " learning that have been used alternatively and interchangeably in the literature.

"Co-operation & collaboration do not differ in terms of whether or not the task is distributed, but by virtue of the way in which it is divided; in co-operation the task is split (hierarchically) into independent subtasks; in collaboration cognitive processes may be (heterarchically) divided into intertwined layers. In co-operation, co-ordination is only required when assembling partial results, while collaboration is ...a co-ordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of a problem" (Dillenbourg et al., 1995).

Co-operative learning is a learning process during which students learn as a result of interaction with each other. As Slavin (1980) comments co-operative learning refers to classroom techniques in which students work in small groups and receive rewards or recognition based on their group's performance. Panitz (1996), in an attempt to clarify the differences between collaborative and co-operative learning, provided us with the following definitions:

*"Collaborative learning (CL) is a personal philosophy, not just a classroom technique. In all situations where people come together in groups, it suggests a way of dealing with people which respects and highlights individual group members' abilities and contributions. There is a sharing of authority and acceptance of responsibility among group members for the group's actions. The underlying premise of collaborative learning is based upon consensus building through co-operation by group members, in contrast to competition in which individuals best other group members. Collaborative learning practitioners apply this philosophy in the classroom, at committee meetings, with community groups, within their families and generally as a way of living with and dealing with other people".*

*"Co-operative learning is defined by a set of processes which help people interact together in order to accomplish a specific goal or develop an end*

product which is usually content specific. It is more directive than a collaborative system of governance and closely controlled by the teacher. While there are many mechanisms for group analysis and introspection the fundamental approach is teacher centered whereas collaborative learning is more student centered".

However, there is a plethora of definitions on collaborative/co-operative learning that can be found in the literature. Our personal preference corresponds to the one given by Dillenbourg (1999). Dillenbourg has taken up the role of the editor in a recent publication on collaborative learning. He does not hesitate to admit that his group has not agreed on the definition of collaborative learning. So, he ends up with a rather broad yet abstractive definition:

"Collaborative learning is a situation in which two or more people learn or attempt to learn something together" (Dillenbourg, 1999: 2).

Based on the previous definitions it seems that the collaborative approach is more of a philosophy that places the student in the centre of the learning procedure, whereas the co-operative approach seems to be based on a specific set of techniques that facilitate the accomplishment of group learning.

It seems that the co-operative learning is more of a teacher-controlled approach. In addition, the co-operative learning tradition tends to use quantitative methods that look at achievement, or other learning outcomes. It seems to be more structured and it requires more training in its approaches. On the other hand, the collaborative tradition uses rather qualitative approaches. Teachers applying collaborative learning tend to come from a humanities or social sciences background. This approach requires students to receive less training in applying its techniques.

However, both approaches seem to have come up with some sort of decisions based upon: a) the role of the teacher in the learning procedure, b) the nature of the learner, c) the authority of knowledge. Thus, there are commonalties shared by both approaches, as long as differences between them. The commonalties as Matthews et al. (1995) identified them are the following:

- learning in an active mode is more effective than passively receiving information;
- the teacher is a facilitator, coach, or midwife rather than a "sage on the stage";
- teaching and learning are shared experiences between teacher and students;
- balancing lecture and small-group activities is an important part of a teacher's role;



- participating in small-group activities develops higher-order thinking skills and enhances individual abilities to use knowledge;
- accepting responsibility for learning as an individual and as a member of a group enhances intellectual development;
- articulating one's ideas in a small-group setting enhances a student's ability to reflect on his or her own assumptions and thought processes;
- developing social and team skills through the give-and-take of consensus-building is a fundamental part of a liberal education;
- belonging to a small and supportive academic community increases student success and retention; and
- appreciating (or at least acknowledging the value of) diversity is essential for the survival of a multicultural democracy.

Additionally, the same authors also identified a number of differences that seems to be based on three parameters:

- the style, function, and degree of involvement of the teacher;
- the issue of authority and power relationships between teacher and student;
- the extent to which students need to be trained to work together in groups;
- how knowledge is assimilated or constructed; the purpose of groups to emphasise different outcomes such as the mastery of facts, the development of judgement, and/or the construction of knowledge; the importance of different aspects of personal, social, and/or cognitive growth among students; and
- a variety of additional implementation concerns including, group formation, task construction, and the degree of individual and/or group accountability necessary to ensure equitable distribution of work and accurate grading (Matthews, et al., 1995).

### **2.1.2 THEORIES OF LEARNING IN COLLABORATION**

Dillenbourg et al. (1996) points out that theories of collaborative learning tended to focus their attention on how individuals function in a group. Dillenbourg et al. (1996) identified three main theories of learning that applicable in collaborative settings, namely:

- socio-constructive theory
- socio-cultural theory
- shared cognition theory.

**Socio-constructive theory**, inspired by Piaget's (1928) cognitive development theory, suggests that learning is constructing by social interaction with others and "enhanced the role of interactions with other rather than actions themselves" (Dillenbourg et al., 1996: 3). The socio-constructive approach focuses its attention on the interaction and co-ordination with others (Doise & Mugny, 1984). The experimental set-up used two phases (pre- and post-test) separated by an intervention session. A number of empirical studies reported by Dillenbourg et al. (1996) undertaking the socio-constructive approach.

**Socio-cultural theory** derived from Vygotsky's (1962; 1978) *Zone of Proximal Development* approach, that has been characterised by Vygotsky (1978) as the distance between the actual developmental level and the level of potential development through problem solving or through collaboration with more capable peers. As Dillenbourg et al. (1996) noticed "while the socio-cognitive approach focused on individual development in the context of social interaction, the socio-cultural approach focuses on the causal relationship between social interaction and individual cognitive change...whereas a Piagetian approach sees social interaction as providing a catalyst for individual change, often dependent upon individual development, from a Vygotskian perspective, inter-psychological processes are themselves internalised by the individuals involved" (p.5).

**Shared-cognition theory**, differs in a way from the two previously mentioned ones in the sense that the environment is considered to be an integral part of the learning activity. According to Dillenbourg et al. (1996) the environment consists of two contexts, the physical and the social one with the focus placed mainly on the social context. This approach challenged the methodology used in many experiments as it:

- questioned the theoretical basis on which research paradigms were previously built on (distinction on what is social and cognitive)
- viewed collaboration as a process of building and maintaining a shared conception of a problem
- focused on the social plane, where emergent conceptions are analysed as a group product (Dillenbourg et al., 1996: 6-7).

### 2.1.3 AN ABSTRACTIVE OVERVIEW OF COLLABORATIVE LEARNING METHODS

A number of co-operative learning methods have been developed and used over the years. This part of the literature review aims to provide an abstractive overview of the most important, widely adopted by teachers in practice.

**Circles of Learning (Learning Together):** This method was developed by Johnson and Johnson in 1975. The main component of the method is that there is a group goal, sharing of ideas and material, a division of labour and group rewards. Student members of the group have to understand clearly the group set of questions, get involved in the procedure of co-operation and help each other before asking any questions to the teacher. The teachers give rewards based on the group performance.

In 1984 Johnson and his colleagues published a book on the method called the Circles of Learning. As the basic elements of co-operative goal structure identified positive interdependence, individual accountability, face-to-face interaction, and co-operative skills. The teacher's role in structuring co-operative learning has been identified specifying lesson objectives, placing students in productive learning groups and providing appropriate materials, clearly explaining the co-operative goal structure, monitoring students, and evaluating performance. They identified 18 steps for the successful implementation of the method including: the specification of the instructional objectives, the group's structure in order to assure heterogeneity, suggestions on the group size and assignment of roles to ensure interdependence, evaluation of the student's work through evaluation and discussion.

**Jigsaw Methods:** The original Jigsaw method developed by Aronson in 1978. The method seeks to place the students into small interactive groups. Each student should be given a small part of the topic under investigation to study. Then each student is responsible for teaching their part of the lesson to the rest of the group members in order to form a complete jigsaw picture. In addition, students from different groups studying the same material meet to discuss their part of the topic. In 1980 Slavin developed an adaptation of the Jigsaw method. Jigsaw III developed by Gonzalez and Guerrero in 1983.

**Student Teams Achievement Divisions (STAD):** This co-operative learning method developed by Slavin in 1980 and is mainly based on the competition among groups of students. Competition is an essential factor that enhances the group's performance and achievement. Later Slavin (1983) introduced group reward as another factor for the group's better achievement. Individual accountability to the group is accomplished by having each member's score on a quiz contribute to the team score. Student's scores are adjusted so that points contributed to the team are based on improvement over previous performance.

**Team-Assisted Individualisation (TAI):** Developed by Slavin in 1985 this method attempts to combine the group reward component with an individualised program. The new aspect of the method is that each student works individually. Team members are testing each other before they ask for any help from the teacher that acts as a resource provider.

**Group Investigation:** This method developed by Sharan and his colleagues in 1976 includes what is called co-operative goal structure. There are four characteristics of the method:

- The class is divided into groups studying a specific topic
- The topics are multifaceted
- Students must gather information, plan, analyse and integrate their work
- The teacher is acting as a resource provider, giving guidance when it is needed.

The method of Group Investigation actually involves six different steps of implementation:

- The teacher introduces a general new topic that is divided into subtopics through discussions with the students that form different groups. Three different types of goals need to be considered that are: instructional, organisational, social
- Students make plans for the further implementation of their investigation and they divide their labour
- Students start to implement their plans and at the same time group discussions are taking place
- Students analyse and evaluate the information they have gathered
- Students present a summary of the results of their investigation to the rest of the class
- Reports, presentation and individual learning are evaluated. Group rewards consist of teacher and peer recognition.

A new version of Group Investigation has come out in 1992. The book provides educators with the background and procedures needed to conduct group investigation. The book reviews the fundamental ideas, on which group investigation is built, suggest ways of developing cooperative discussion and planning skills that are essential for carrying out group investigation. Detailed examples of actual projects, reviews of research on the effectiveness of group investigation are given (Sharan & Sharan, 1992).

## **2.1.4 LEADING RESEARCHERS IN FACE-TO-FACE COLLABORATIVE LEARNING**

There is a long history of research on co-operative/collaborative learning that continues for many years. Hundreds and hundreds of studies have come up trying to measure the effectiveness of co-operative learning or present its benefits. However, over the years, three main leading researchers have conducted the bulk of the research and their work is remarkable. We are referring to Slavin and Johnson and Johnson.

### **2.1.4.1 SLAVIN'S CONTRIBUTION TO COLLABORATIVE RESEARCH**

The benefits of co-operative learning are reported by Slavin (1992) in two main areas: student achievement and student social relationships.

#### **2.1.4.1.1 COGNITIVE OUTCOMES**

##### **Co-operative Learning and Student Academic Achievement**

For Slavin (1980) classroom technology can be described as a combination of three essential elements: a task structure, a reward structure and an authority structure. Slavin (1992) reviewed the literature and theory about the relationship between co-operation and achievement and analysed the effects of different task and outcome measures in laboratory and field research. Studies of other researchers suggest that co-operative learning affects student performance, productivity, transfer of learning, time on task and attitude (Johnson & Johnson, 1989; Rysany & Sales, 1991; Sharan, 1980; Slavin, 1990).

The reward structure, based on task structure that makes up a school day, vary on several dimensions. Some positive rewards include grades, teacher approval and tangible rewards. There is also the competitive reward structure that is a negative reward because students are linked with one another negatively. The opposite of competition is co-operation that is positive reward interdependence, where one student success helps another to be successful. Finally, the authority structure of the classroom refers to the control that students exercise over their own activities, as opposed to that exercised by teachers and other adults.

Co-operative learning for Slavin may involve changes in all three of the major elements of classroom technology, but it is primarily a change in the interpersonal reward structure of the classroom, from a competitive reward structure to a co-operative one. There are two primary outcomes that are important in research on reward structures: performance and cohesiveness.

Performance refers to individual and group productivity; cohesiveness includes such variables as liking of others, feeling of being liked, group evaluation, race relations, etc.

Co-operative learning techniques differ primarily along five dimensions: reward interdependence, task interdependence, individual accountability, teacher-imposed structure and use of non-use of group competition. Slavin also has reviewed all the research conducted on various co-operative learning techniques in a number of studies. Three outcomes of co-operative learning are emphasised in this review: academic achievement, race relations and mutual concern among students (Slavin, 1980).

### Achievement

Slavin (1980) stated that co-operative learning techniques show positive effects on academic achievement, he also noticed differences in the use of techniques. In an attempt to find possible explanations, he identified various factors that probably differentiate the techniques, namely: subject matter, population, group competition, use or non-use of training of teachers and students.

### Race Relations

Effects of student teams on interracial friendship may be the most important of the outcomes of co-operative techniques as interracial co-operation is by far the most effective means of improving racial attitudes and behaviour in schools.

### Mutual Concern

The effects of co-operative learning techniques on mutual concern have been generally quite positive and there are no obvious methodological differences in the effects (Slavin, 1980).

#### **2.1.4.1.2 NON-COGNITIVE OUTCOMES OF CO-OPERATIVE LEARNING**

Many researchers have studied non-cognitive outcomes of co-operative learning and have found evidence that co-operative learning can have impacts on a broad range of variables. Slavin (1990) reviews and discusses the research related to some of the most extensively studied of the non-cognitive outcomes of co-operative learning.

## Intergroup Relations

Slavin (1990) believes that co-operative learning is an ideal solution to the problem of providing students of different ethnic groups with the opportunity to interact with each other, as the presence of students of different races or backgrounds actually enhances inter-group relations. A number of researchers have found positive effects of different co-operative learning methods on ethnic attitudes and inter group relations (Sharan et al., 1984; Kagan et al., 1985; Cooper et al., 1980; Ziegler, 1981).

## Acceptance of Mainstream Academically Handicapped Students

Slavin (1990) believes that co-operative learning is an obvious solution for the social integration of handicapped children as classrooms based on competition structures can affect the handicapped children negatively. However, if the classroom is changed so that co-operation rather than competition is emphasised and so that academically handicapped students can make a meaningful contribution to the success of a co-operative group, acceptance of such students seems likely to increase. According to Slavin (1990) results of the research studies on acceptance of mainstream academically handicapped students are rather mixed although in general terms are positive (Cooper et al., 1980; Johnson & Johnson, 1981b).

## Self-Esteem

For Slavin (1990) perhaps the most important psychological outcome of co-operative learning methods is their effect on student self-esteem. Two of the most important components of student self-esteem are the feeling that: a) they are liked by their peers and b) they are doing well academically.

Co-operative learning methods can affect both components because co-students:

- typically are named as friends
- feel more successful in their academic work
- achieve more than they do in traditional classrooms.

Slavin (1990) concludes that evidence concerning co-operative learning and self-esteem is not completely consistent. Some researchers (Blaney et al., 1977; Geffner, 1978; Lazarowitz et

al., 1982; Madden & Slavin, 1983) have found positive effects on student self-esteem. On the other hand, Gonzales (1981) found no difference on this measure.

### Proacademic Peer Norms

One of the most important tenets of motivational theories of co-operative learning is that co-operative goals create peer norms that support high achievement. The argument is that co-operative learning motivates students to work more and thereby get students to feel that their classmates want them to do their best. The results from the research indicate that:

- a number of researchers found positive effects of co-operative learning on peer norms supporting individual achievement,
- students wanted to achieve because their group mates wanted to do so,
- individuals in co-operative groups exerted social pressures on one another to achieve (Slavin, 1990).

### Locus of Control

The degree to which students believe that their academic success depends on their own effects (internal locus of control) shown on many occasions to be the single personality variable most consistently related to high academic performance (Slavin, 1990). Several studies have found that internal locus of control is positively influenced by co-operative learning methods (Slavin, 1978; Johnson et al., 1978).

### Time On-Task and Classroom Behaviour

Co-operative learning is hypothesised to increase time on-task by engaging student's attention and by increasing their motivation to master academic materials. Most studies have found higher proportions of engaged time for co-operative learning strategies than for control students (Slavin, 1978; Ziegler, 1981; Johnson & Johnson, 1981b).



## Liking of Class

Research on this variable is more inconsistent than that on any of the other non-cognitive outcomes (Slavin, 1990). Some studies have found significantly greater liking of class in co-operative than in control classes (DeVries et al., 1974; Lazarowitz, 1982; Slavin et al., 1984). However, other studies found no difference that made by co-operative learning on this measure (Slavin, 1978; Madden & Slavin, 1983; Oickle, 1980; Johnson et al., 1985).

## Liking Classmates

Co-operative learning methods as social interventions should develop social outcomes (Slavin, 1990). Slavin's (1990) criteria for positive inter-group relations include contact, perceived similarity, engaging in pleasant activities, co-operation (individual's work toward the same goal - come to see one another as providers of rewards).

The most of the studies found positive effects. Co-operative learning students named more friends than did control students, and they named fewer classmates as individuals when they would not like to work with them (Slavin, 1978; Oickle, 1980; Slavin & Karweit, 1981; Cooper et al., 1980). In only one study of those reviewed by Slavin (1990) liking of students found no differences on ratings of classmates, but it did find that students felt that they were liked by their classmates more consistently than did control students (Blaney et al., 1977).

Slavin (1990) concludes that the preponderance of the evidence, including the evidence from the race relations on mainstreaming studies supports that co-operative learning promotes positive relationships between students.

## Co-operation Altruism and the Ability to Take Another's Perspective

Slavin (1990) anticipated that one of the non-cognitive outcomes of a co-operative experience is that students will become more co-operative or altruistic. The research shows that students who used co-operative learning methods made more altruistic choices than did control students (Hertz-Lazarowitz, 1980; Kagan et al., 1985).

Therefore, Slavin (1990) concludes that co-operative learning has shown an overall positive effect on student self-esteem, peer support for achievement, internal locus of control, time on-task, liking of class and classmates.

## **2.1.4.2 JOHNSON AND JOHNSON'S CONTRIBUTION IN COLLABORATIVE RESEARCH**

For Johnson and Johnson five are the most essential factors influencing co-operation in the classroom namely positive interdependence, face-to-face promotive interaction, individual and group accountability, teaching and use by the students of the appropriate group skills and finally group processing.

**Positive Interdependence:** The group members are relying on each other in order to achieve the group aims and goals. The positive interdependence relies on the fact that the group members are linked in such a way that everyone has to succeed for the group to succeed. If some of the group members fail to play their role in the group then all the other group members will suffer the consequences. Therefore, each group member is required for the final success of the group and each group member has a unique contribution to make.

**Face-to-face Promotive Interaction:** The group mainly functions when the group members are doing their tasks interactively, meaning that the group members will have to share resources, provide each other with feedback on their work, challenge, help and encourage one another. Ways to succeed their group aims include the explanation of solving the problems occurring, the transfer of their knowledge on a specific topic to the other group members, the discussion of the concepts arise, challenging of understanding and the production of conclusions. It is quite important to notice that the promotive interaction procedure needs be done preferably face-to-face.

**Individual and Group Accountability:** There are two levels of accountability recognised the individual and the group accountability. The group must be accountable for achieving its goals and all the group members are accountable for doing their share of the work.

**Teaching and Use by the students of the Appropriate Group or Collaborative Skills:** Students are encouraged to develop the appropriate teamwork or collaborative skills in order to be able to function in the group. However, the collaborative skills will not appear on their own. The appropriate skills such as leadership, trust building, decision making, communication and conflict management will have to be taught, developed and practised by the group members.

**Group Processing:** As the group goals have been set by the group members, the group processing refers to the discussion and assessment of the achievement of the group goals. Therefore, the positive and negative aspects of the group function will be identified and they could be used in the future to enhance the group effectiveness (Johnson, Johnson & Smith, 1991; Johnson, Johnson & Holubec, 1993; Johnson, Johnson, 1995).

### 2.1.4.3 SEMIOTICS AND COMMUNICATION

To the question what is semiotics, a difficult one to answer, semioticians have debated its definition and even whether it is a science, field, theory, discipline, doctrine or simply an approach. Semiotics characterised as a way of thinking about the mind, how we come to know and communicate that knowledge. As such, semiotics might be thought of as an attempt to answer long standing epistemological questions about the nature of knowledge and knowing, drawing insights from a wide variety of disciplines: philosophy, anthropology, linguistics, cognitive science, neurology, psychology, visual art, music, dance, and education. At the heart of semiotics is the notion of sign. In essence, semiotic theory claims that our knowledge of the world is mediated through signs and can never, therefore, be isomorphic with the objects of the world (Cunningham, 1992).

"A sign is only an incomplete representation of the object. Only certain aspects of the object are represented and it is these aspects that come to define the interpretant, the "effect" or outcome of the sign process. Different signs may represent different aspects of the object and thereby produce different outcomes. Additionally, signs have aspects that are not relevant to the object (that may be characteristics of the sign as something in the world of experience, but not of the object) and that can produce additional, different interpretants" (Cunningham, 1992: 169).

Saussure (1971) described semiotics as a science, which studies the life of signs. He offered a two-part model of the sign composed of:

- a 'signifier' (*signifiant*) - the form, the image the word the sign takes; and
- the 'signified' (*signifié*) - which is the concept the signifier represents, or the meaning.

The *sign* is the whole that results from the association of the signifier with the signified (Saussure, 1971). However, the relation between a signifier and its signified is *not* a matter of individual choice; if it were then communication would become impossible. As Hawkes (1977) commented Saussure presented the argument that language should be studied, not only in terms of its individual parts, not only diachronically, but also in terms of the relationship between those parts and synchronically, in terms of its current adequacy.

Semiotics is often employed in the analysis of texts. A text is an assemblage of signs (such as words, images, sounds and/or gestures) constructed (and interpreted) with reference to the conventions associated with a genre and in a particular medium of communication. The term "medium" is used in a variety of ways including broad categories such as speech and writing or print and broadcasting or relating to specific technical forms within the *mass media* (radio, television, newspapers, magazines, books, photographs, films and records) or the *media of*

*interpersonal communication* (telephone, letter, fax, e-mail, video-conferencing, computer-based chat systems).

Communication is defined as the transfer of information from a source to a receiver. The goal of a communicator is to accomplish this process efficiently and effectively and communication theorists are committed to find and provide models by which communication can be enhanced. Semioticians theorising beyond text tend to argue that communication is a process of reality construction referring also to the creation of interpretation of texts as "encoding" and "decoding" as coded messages are everywhere (Hawkes, 1977). The decoding of text involves the comprehension of what the text is saying but also the interpretation of its meaning. However, interpretation can surpass what is said (Olson, 1994).

Semioticians are more concerned about the essence of meaning making. The notion of the importance of sense-making has had a particular appeal for communication and media theorists who stress the importance of the active process of interpretation. The meaning of a sign is not contained within it, but rather arises in its interpretation. Additionally, the role of the interpreter must be accounted for as an essential part of the process of semiosis presented by Peirce (1931) as a triadic model that included:

- **The Representamen:** the form which the sign takes (not necessarily material);
- **An Interpretant:** *not* an interpreter but rather the sense made of the sign;
- **An Object:** to which the sign refers.

The interaction between the *representamen*, the *object* and the *interpretant*- is the process of semiosis. Sless (1986) declares that "statements about users, signs or referents can never be made in isolation from each other. A statement about one always contains implications about the other two" (p.6).

Communication is based on a transmission model that involves the existence of a sender who transmits a message to a receiver (Reddy, 1979). Jakobson (1960) suggested a model of verbal communication that moved a step beyond the traditional transmission model stressing the importance of social contexts and codes that previous communication models failed to highlight (Shannon & Weaver, 1949). Jakobson (1960) lists a number of verbal communication factors essential in any case of communication:

"The *addresser* sends a message to the *addressee*. To be operative the message requires a *context* referred to ('referent' in another, somewhat ambivalent, nomenclature), sizeable by the addressee, and either verbal or capable of being verbalised, a *code* fully, or at least partially, common to the addresser and addressee

(or in other words, to the encoder and decoder of the message); and finally, a *contact*, a physical channel and psychological connection between the addresser and the addressee, enabling both of them to stay in communication" (Jakobson, 1960: 353).

Later Hall (1980) suggested another model of mass communication based on television discourse and highlighted the importance of active interpretation within relevant codes. Hall commented that decodings do not necessarily follow from encodings.

## **2.1.5 MODELS OF FACE-TO-FACE GROUP DYNAMICS AND DEVELOPMENT PROCESSES**

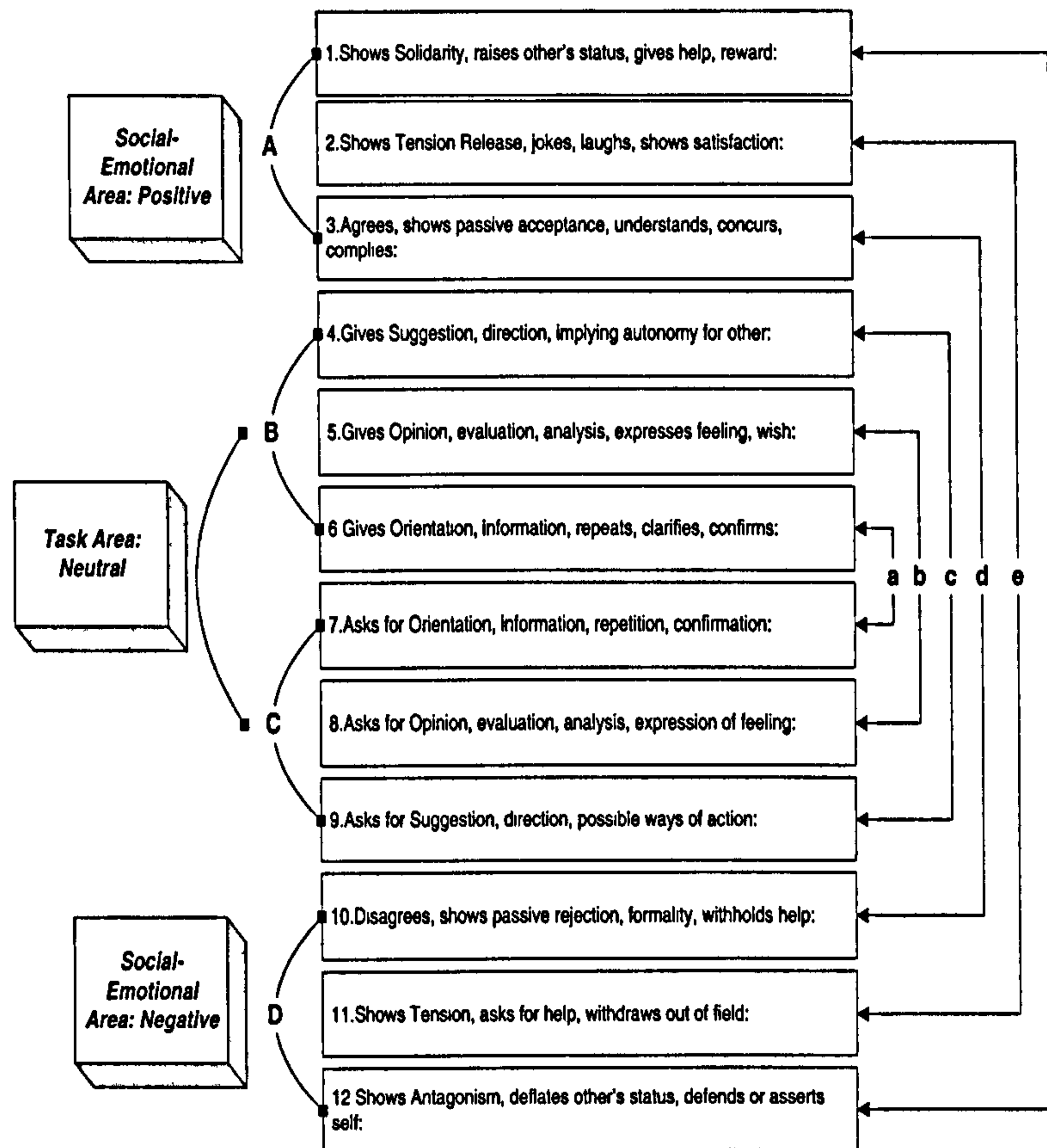
The following section of the literature review aims to offer an abstractive overview of various theoretical aspects of existing models of face-to-face group dynamics and development processes. However, it has to be noticed that presentation of some of the existing models of group dynamics only aims to be used as background to the current research. None of the following theories was used in comparison with the results of the present study.

Tuckman (1965) reviewed and evaluated the literature dealing with the development of sequence in small groups and proposes a developmental model, that can be summarised in the following stages:

- 1) *Forming*: This is the initial stage of group development. Groups are initially concerned with orientation that is accomplished through testing of interpersonal and task behaviours. Dependency relationships with leaders and group members are established.
- 2) *Storming*: This stage is characterised by conflicts around interpersonal issues.
- 3) *Norming*: The resistance characterised the previous stage is overcome here as conflicts are resolved and new standards and roles are adopted.
- 4) *Performing*: In this final stage "roles become flexible and functional, and group energy is channelled into the task. Structural issues have been resolved, and structure can now become supportive of task performance" (Tuckman, 1965: 396).

Finally, as the group has gone through all the previous stages a sensitivity among the group members is established and the group becomes a "functional instrument for dealing with the task" (p.369).

Bales (1950) developed a method for the observation and study of small groups, called *Interaction Process Analysis (IPA)* that was based on the analysis Bales undertook with hundreds of groups. Bales's method includes a standard set of twelve categories for observation and analysis as shown in the following Figure 2.1.



**KEYS:**

- |   |                               |   |                    |
|---|-------------------------------|---|--------------------|
| a | Problems of Communication     | A | Positive Reactions |
| b | Problems of Evaluation        | B | Attempted Answers  |
| c | Problems of Control           | C | Questions          |
| d | Problems of Decision          | D | Negative Reactions |
| e | Problems of Tension Reduction |   |                    |
| f | Problems of Reintegration     |   |                    |

Figure 2.1- The System of Categories in Observation and their Major Relations: Bales 1950:

9

The system provided by Bales involves the arrangement of the categories in different ways.

- Bales (1950) suggests that the simplest way to conceive a problem-solving sequence is in terms of the four sections A, B, C, and D. Where A contains several varieties of Positive Reactions, B constitutes a group of Attempted Answers, C can be generally characterised as Questions, and D contains the Negative reactions.

- Another way of describing the relations among the categories regards the middle area of the system where sections B and C constitute the area of Task Problems, and the terminal sections A and D constitute the area of Socio-Emotional Problems. Therefore, "when attention is given to the task, strains are created in the social and emotional relations of the members of the group, and attention turns to the solution of these problems" (p.8).
- There is a symmetrical relation between the top and bottom half of the category list. The list is divided in two parts, the first part constituting of the first six categories and the second part consisting of the next six categories. For each category there is a companion category in a symmetrical position. For instance, Categories 7 and 6 are concerned with the functional problem of communication, 8 and 5 are concerned with problems of evaluation, etc.
- Six main phases are identified as communication, evaluation, control, decision, tension reduction, and reintegration. The first phase of the meeting must be devoted to "getting an initial factual or cognitive orientation to the problem" (p.11). The next phase is dealing with the analysis of the situation the light of group's values, needs and desires. The following step deals with finding ways of controlling the findings of the situation, up to the point of the next phase of crystallisation of the group's intent. "Then a period of laughing and joking might appear as the penultimate phase, releasing and dissipating the various tensions created in the process up to that point" (p.11). Finally, a phase of reward and praise would bring the meeting to its close.

One year later, Bales and Strodtbeck (1951) added a new set of variables to the prior categories of observation that are: "1) the personalities of the individual members in their idiosyncratic aspects, 2) characteristics that group members have in common, as a part of their parent culture, as well as of the particular group under observation; and 3) the organisation of the group, that is, the expectations the members have established concerning their social relationships with each other and their different positions in this total constellation of expectations" (p.486).

Schutz (1958) developed his own model that has been called *FIRO* (Fundamental Interpersonal Relations Orientation). The title was chosen by the writer as "it signifies the basic idea that every person orients himself in characteristic ways towards other people, and the basic belief that knowledge of these orientations allows for considerable understanding of individual behaviour and the interaction of people" (p.vii).

According to Schutz's model (1958) a group forms and develops following three interpersonal needs: *inclusion*, *control*, and *affection*. The *inclusion* phase starts with the formation of the group. During this phase members of the group are trying to find if they fit in the group, to

what degree they will become or not become members of the group. In other words, group members are faced with a problem of identity. Once the inclusion problems have been settled, the group members are faced with the issue of decision-making procedures in the *control* phase. "Characteristic behaviour of this stage includes a leadership struggle, competition, discussion of orientation to the task, structuring, rules of procedure, methods of decision making, and sharing responsibility for the group's work" (p.171). Finally, as the group roles and task have been settled, the group goes through the final stage of *affection*. During this phase the group members are attempting to "successively achieve an optimal amount of interchange and an optimal degree of initiating and receiving, with respect to the group, regarding interaction, responsibility or influence, and love or emotional closeness" (p.171). After the group has gone through the "cyclical phases of inclusion (I), control (C), and affection (A), another cycle may begin prior the termination of the group. Therefore, the sequence of interaction for any interpersonal relation or group could be: I C A I C A ...A C I" (p.169).

Bion, a practising psychoanalyst developed a model of group operation, or rather a psychoanalytic training process, based in three basic assumptions. The three basic assumptions are *dependence*, *pairing* and *fight-flight* (Bion, 1949; Bion, 1961). The first assumption, that has called *dependence*, is the one where the group "is met in order to be sustained by a leader on whom it depends for nourishment, material and spiritual, and protection" (Bion, 1961: 147). The second assumption (*pairing*) also concerns the purpose for which the group has met. Bion (1949) described the phase of *pairing* as follows: "some patterns of behaviour were recurring and, in particular, one that went like this: two members of the group would become involved in a discussion; sometimes the exchange between the two could hardly be described but it would be evident that they were involved with each other, and that the group as a whole thought so too" (p.14). The third basic assumption of Bion's group operation is called *fight-flight*. During this phase the group "has met to fight something or to run away from it" (Bion, 1961: 152). The role of the leader is quite vital during this stage of final assumption, as he or she is going to be the one to demand action from the group.

Hare and Naveh (1984) identified four stages of problem-solving procedures in groups. Their method was called *LAIG* that stands for Latent-Adaptation-Integration-Goal. The first phase of Hare and Naveh's model is *latent* pattern maintenance and tension reduction. During this phase the group needs to make an agreement on aims, priorities and methodologies that are going to be set and used. The second stage, *adaptation*, involves the identification of the appropriate skills and group member roles. The following stage, that is called *integration*, involves flexibility and compromise. The final stage is the group's *goal* accomplishment.



Gersick (1988, 1989) proposes a new model of conceptualisation of the group development based on the group member's awareness of time and mechanisms of change. For Gersick (1988) groups progress in patterns of "punctuated equilibrium through alternating inertia and revolution in the behaviours and themes through which they approach their work" (p.9). Gersick's model suggests that groups develop through "sudden formation", "maintenance", and "sudden revision", a process that is called "punctuated equilibrium". The framework of Gersick's model involves two phases:

*Phase 1:* A framework of behavioural patterns emerges during the first meeting and the group stays with it through the first half of its life. At the midpoint of the group's calendar time, the group undergoes a transition that sets new directions. The transition "is a powerful opportunity for the group to alter the course of its life midstream".

*Phase 2:* Phase 2 is a second period of inertial movement that takes "its direction from plans crystallised during the transition" (p.32).

Robbins (1993) based on Tuckman's (1965) and Gersick's (1988; 1989) developed a five-stage model that can be described by the following steps: 1) *forming* and, 2) *storming*, 3) *norming*, 4) *performing*, and 5) *adjourning*, as shown next in Figure 2.2

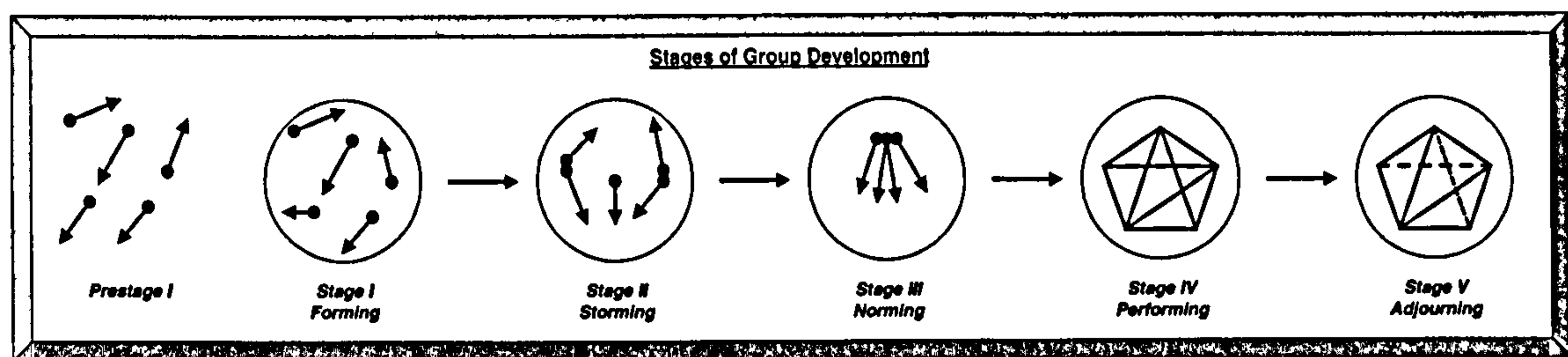


Figure 2.2- Stages of Group Development: Robbins 1993: 242

The first stage, *forming*, is characterised by "a great deal of uncertainty about the group's purpose, structure and leadership" (Robbins, 1993: 242). During this first stage group members are trying to determine what behaviour is acceptable and make an effort to think of themselves as part of the group. The second stage, *storming*, is characterised by intragroup conflict that controls the group interaction. "Members accept the existence of the group, but there is resistance to the constraints that the group imposes on individuality" (Robbins, 1993: 242). During this stage the hierarchy structures will start becoming clear. The third stage, *norming*, is the one during which relationships develop and the group starts demonstrating cohesiveness. By the end of this stage the group has set expectations of group members' behaviour. The fourth stage, *performing*, is the one where the group is fully functional trying to perform the task. Finally, the fifth stage, *adjourning*, involves the move of the group's attention "towards wrapping up activities" rather than task performance (Robbins, 1993: 243).

However, Robbins (1993) comments that what makes a group effective is far more complex than the model itself acknowledges. As "under some conditions, high levels of conflicts are conducive to high group performance. So, we might expect to find situation where groups in Stage II outperformed those in Stage III or VI...sometimes, in fact, several stages go on simultaneously... therefore, even the strongest proponents of this model do not assume that all groups follow its five-stage process precisely" (p.243).

## **2.2 GROUP ISSUES AND DYNAMICS IN COMPUTER-MEDIATED COMMUNICATION**

### **2.2.1 INTRODUCTION**

The following part of the literature review aims to provide the reader with some issues concerning group dynamics and interaction in computer-mediated communication, focusing on factors that effect that interaction. The review was divided into five parts consisting of participation, decision-making, disagreement, and leadership, along with issues concerning the text-based nature of computer conferencing, in order to match the findings of the present research.

As presented in the first part of the literature review a number of theoretical models developed attempting to describe and present face-to-face group theories, methods, models, dynamics and processes along with behaviour and outcomes. On the other hand, although there are a number of studies concerning computer-mediated group behaviour and issues, the majority of them rely on laboratory experiments (Dubrovsky et al., 1991; Poole et al, 1993; Siegel et al., 1986). However, "computer-mediated communication (CMC) has been hailed by distance educators as a medium that can facilitate collaborative or group learning at a distance" and can "provide an additional conferencing feature that supports group and many-to-many communication" (Gunawardena, 1991: 14-15).

Hiltz et al. (1986) proposed that computer-mediated groups could probably encourage different communicative behaviours in comparison to face-to-face groups, as conditions are changed, and computer-mediated environments are subject to limited information exchange. Walther (1992) points out that most of research and studies concerning computer-mediated communication interactions has been conducted without much background knowledge on previous theories or without the establishment of a common framework.

Both positive and negative effects of the computer-mediated communication were reported in the literature influencing the on-line group interaction and processes. In general terms, computer-mediated communication is considered to be less influenced by the social norms (Kiesler and Sproull, 1992). The lack of everyday social and communication cues, caused by the text-based nature of computer conferencing is one of the most important issues referring repeatedly in the literature. Kiesler and Sproull (1992) suggest that computer-mediated communication may help to "overcome social inhibitions, encourage communication across social or psychological boundaries and, deregulate group behaviour" (p.104).

Computer-mediated communication is changing not only the way we think but also the ways we use written language (Ferrara et al., 1991) as it reshapes the forms and functions of language (Crook, 1985). Therefore, the use of language in computer-mediated communication is lying between the two extremes of oral and written language (Collot & Belmore, 1996; Yates, 1996), or assumes a dichotomy between written and oral language (Orlikowski & Yates, 1993).

The written form of computer-based interaction and the elimination of the non-verbal or paralinguistic cues have been studied widely (Kerr & Hiltz 1982; Kiesler et al., 1984; Feenberg, 1989). CMC limited to textual communication eliminates the social cues (Sproull & Kiesler, 1986), people try to provide their own translations of non-verbal cues (Steinfeld, 1986), or try to compensate for the lack of contextual cues (Aoki, 1995). Additionally, teleconferencing systems found to diminish social interaction and sense-making (Rice-Lively (1996). On the other hand, computer-mediated groups have the ability to record the messages of the group member's contribution that can be used as a basis for reflective analysis (Feenberg, 1989; Rimmershaw, 1999; Kaye, 1992). Furthermore, it has been demonstrated by the literature that CMC promotes lower degrees of conventionality and formality (McGuire et al., 1987; Weisband, 1992).

Computer conferencing is considered to encourage more egalitarian interaction among the group members providing a forum that allows chances of more equal participation (Siegel et al., 1986; Hiltz et al., 1986; Easton et al., 1990; Kiesler & Sproull, 1987; Marjanovic, 1999). Students with the most participation in computer conferencing were not necessarily the ones who dominated the class meetings (Harasim, 1993a; Alberektson, 1995; Rimmershaw, 1999; Conlon, 1997). Students with limited participation in face-to-face situations made considerable contributions in computer conferencing as an immediate result of the lack of social and communication cues (Alberektson, 1995; Rimmershaw, 1999; McConnell, 1990).

Studies on computer-mediated communication also dealt with women's access to new technologies (Durdell & Lightbody, 1993; Colley et al., 1995; Durdell & Thomson, 1997), gender and on-line identity (Spender, 1996; Turkle, 1996), gender related language use (Herring, 1993), use of pseudonyms (Selfe & Meyer, 1991; Jaffe et al., 1999).

Literature was also concerned with the effects technical troubles like system crashes, software or hardware problems had on on-line communication (Graham & Scarborough, 1999; Harasim, 1993a; Ross, 1996; Harasim, 1993b; Berge, 1997; Cifuentes et al., 1997; Ross, 1996).

Research tested how and if anonymity in computer conferencing would encourage participation (Selfe and Meyer, 1991; Graham & Scarborough, 1999; Davie, 1988; Hiltz, 1986; Harasim, 1987a,b).

Studies in CMC environments indicated a difficulty of the group members to reach consensus (Dubrovsky et al., 1991; Hiltz et al., 1986; Siegel et al. 1986; Weisband, 1992; Sproull and Kiesler, 1993), or proved decision-making time consuming (Sproull and Kiesler, 1993), or draw attention to group polarisation phenomenon in the on-line environment (Kiesler et al., 1984). Research also suggested that participants of CMC environments make riskier decisions in CMC in comparison to face-to-face situations (Siegel et al., 1986; Weisband, 1992). Additionally, decisions were found to be less influenced by the participants' status (Duvrovsky et al. 1991; Hiltz et al., 1986; Sproull & Kiesler, 1993; Kiesler, 1992; Sproull and Kiesler, 1993).

Research has shown that in general terms computer-mediated communication tends to promote disinhibition in comparison with face-to-face communication within group participants (Kiesler et al., 1984; Hiltz et al., 1986) resulting in negative and hostile behaviour such as flaming (Sproull, & Kiesler, 1986; Lea et al., 1992; Siegel et al., 1986; Walther et al., 1994; Rice and Love, 1987; Collins, 1992). Literature also supported the hypothesis of the connection between the absence of social and communication cues with the expression of uninhibited verbal behavior in computer-mediated communication (Collins, 1992; Brouwer, 1997; Berge, 1997) encouraging misinterpretation (Wang, 1996; Shapiro and Anderson (1985).

The role of the potential leader in CMC environments was also discussed in the literature (Ross, 1996; English & Yazdani, 1999; Kerr, 1986). Traditionally the role of the moderator is given to the tutor (Rimmershaw, 1999; Marjanovic, 1999; Murphy et al., 1998). Additionally, a number of writers have identified the roles need to be carried out by the moderator or facilitator of the computer conferencing (Feenberg, 1986; Brochet, 1989; Davie, 1989; McCreary, 1990; Eastmond, 1992; McMann, 1994; Paulsen, 1995; Berge, 1995; Collins and Berge (1997).

The following parts of literature review aims to discuss the issues presented here in more detail.

## **2.2.2 EXPRESSION IN CMC: THE TEXT-BASED NATURE OF COMPUTER CONFERENCING**

### **2.2.2.1 INTRODUCTION**

Computer conferencing has the potential to facilitate group interaction providing a unique mode of group communication. Harasim (1990) has pointed out five key attributes of computer conferencing namely many-to-many communication, place-independence, time-independence, text-based nature of communication, and computer-mediated communication. As communication in computer conferencing is text-based, the written mode promotes reflection and students are provided with the opportunity to revise their ideas and structure their arguments.

Traditional (face-to-face) collaborative learning strategies are based on verbal interaction among the group members. However, learning and interaction that is taking place in on-line group computer conferencing heavily depends on the written form of communication. Actually, communication is in written form only (McConnell, 1997). The only means of communication is via the keyboard and the monitor. In fact, the text-based communication occurring in peer on-line discussion is one of the key features of collaborative learning. For the first time in history, human interaction takes place in a text-based form that is easily transmitted, stored, archived, re-evaluated, edited, and rewritten. Students have opportunities to freeze single frames and focus their attention on them. Therefore, students' own interactions can now become a basis for epistemic engagement and on-line chat can serve the role of thinking devices (Warschauer, 1997). Kiesler et al. (1984) have described computer-mediated communication as having: an absence of regulating feedback, dramaturgical weakness, few social status cues and social anonymity.

Face-to-face group interactions are in synchronous mode. However, with the introduction of computers in collaborative learning the issue of synchronicity have been also introduced and played an important role in group interactions. Modern computer conferencing systems offer features that can support collaborative learning and can provide group members with a communication space. However, the text-based nature of the computer conferencing requires group participants to engage in discussion, and formulate ideas into written communication (Harasim, 1993a).

Computer-mediated communication is changing not only the way we think about the possibilities of communication but also the ways we use written language (Ferrara, 1991). However, as Ferrara et al. (1991) points out "very little is known about the characteristics or conventions of what we term Interactive Written Discourse, the written language occurring in simultaneous terminal-to-terminal typed dialogues" (p.8).

According to Crook (1985) computer-mediated communication reshapes the forms and functions of language. Research also indicates that the use of language in computer-mediated communication is lying between the two extremes of oral and written language (Collot & Belmore, 1996; Yates, 1996). Therefore, computer-mediated communication challenges the "generally assumed dichotomy between written and oral language" (Orlikowski & Yates, 1993).

Ko (1996) investigated the structural characteristics of computer-mediated communication by comparing synchronous CMC with spoken and written corpora. He suggested that another parameter intervenes in CMC use of language dealing with non-real and real time of communication, with the latter being more "speech-like" than the former. Ko (1996) found real-time genre of electronic discourse more similar to spoken than written language as it tends to be "interpersonally involved, syntactically fragmented, and to have a relatively low degree of information focus and elaborateness".

#### **2.2.2.2 SYNCHRONOUS VERSUS ASYNCHRONOUS COMMUNICATION**

Group interaction in a face-to-face traditional group is being delivered in a synchronous mode. However, the on-line group interaction is depending in two different modes of communication, synchronous and asynchronous. The issue of synchronicity in an on-line group communication is quite vital and it is as old as the computer mediated group interaction.

Asynchronous collaborative technologies enable "any-time, any-place" collaboration providing freedom of time (so learners participate when and if they choose), opportunities to research and backup assertion, more time for reflection, more time to face the intervention. While asynchronous collaborative systems have been more dominant in recent times, especially Internet-based conferencing tools and news groups, they may be more suitable for distance learning than for the face-to-face classroom environment due to their asynchronous character (Marjanovic, 1999). The feature of asynchronous CMC is particularly helpful in international collaboration in which people can communicate across different time zones (Aoki, 1995).

On the other hand, synchronous collaborative technologies enable "same-time, same-place" or "same-time, any-place" collaboration providing immediacy, faster planning, problem solving, scheduling and decision making processes. However, the majority of synchronous collaborative tools enable communication (such as text-based chat systems or video conferencing) rather than computer-mediated collaboration (Marjanovic, 1999).

Aoki (1995) adds some other positive aspects of synchronous communication. According to him the synchronous mode of communication serves better for brainstorming. "It may take too long to brainstorm and participants may lose the spontaneity of brainstorming if they use the asynchronous mode only. Additionally, synchronous CMC is more suitable for decision-making as decision-making requires a short turnaround time for responses. Generally, synchronous CMC is appropriate for activities, which do not require lengthy arguments but require immediate responses to get going. Synchronous CMC adds the excitement of interacting with others in real-time. Such excitement could be heightened if the participants were distributed across nations".

For Higgins (1991) synchronous interaction is a critical feature of peer interaction and an important component in the developing theories of the social construction of knowledge as they pertain to co-operative learning. On the other hand, asynchronous interaction may be proved to be helpful to improve group problem solving and lead to richer intellectual quality in the communications.

However, English and Yazdani (1999) reporting for the asynchronous electronic communication comment that it may suit some people and not others. For some people, the fact that they have time to reflect in a conversation and clarify intentions may be considered as an advantage. However, other people may struggle writing things down.

Murphy et al. (1998) in a study addressing ways in which computer conferencing impacted upon interaction patterns among students reported that: "students experienced an initial constraint as a result of having to type all comments" (p.249). They also reported other constraints such as having to use the keyboard in order to communicate with their peers, also having to pause for feedback. Therefore, they quickly discovered that the effort was greater for those poor typing skills and those whose first language was not English.

### **2.2.2.3 TIME**

The issue of time and its importance in computer conferencing was addressed by a number of sources. According to McConnell (1997) "the electronic meetings differ from conventional face-to-face meetings in several respects. In face-to-face meetings there is strong sense of when the group meets. All those involved attend at the same time. Each meeting has a time limit. Time is important...the sense of immediacy is perhaps one of the most important aspects of a face-to-face meetings...In asynchronous computer conferences meetings are continuous; there are no breaks between one meeting and the next...time is less important and



does not necessarily limit the group...Time therefore has different meanings and different consequences for communicating in face-to-face and in on-line groups" (p.348).

Sproull and Kiesler (1993) noticed that the electronic group communication, especially the asynchronous mode, lacks time cues. "Ample time causes groups to use all the time available but also allows them to improve the quality of their interactions and to give more emotional support to one another. It also encourages wider participation" (p.53).

In a number of research studies on-line group interaction was found to be time consuming (Rimmershaw, 1999). According to Graham and Scarborough (1999) the text-based nature of computer conferencing provides limitations to the interaction of the group members, as it is very time consuming when group members are trying to collate answers. Therefore, a need has been identified for helping students to avoid spending much time in the future.

Harasim (1987) in a study that took place in two graduate courses at Ontario Institute providing data on participation rates points out that more time was spent in the on-line than in the face-to-face interaction. She points out that it was a common belief that the electronic groups would spend much more time communicating with their peers in comparison to a face-to-face situation. Different tasks and factors can take up learning time including:

- organising students around computers,
- explaining the learning activity,
- downloading material from the WWW,
- system crashes necessitating rebooting individual machines,
- unavailable links and sites,
- long search times,
- students spending too long on particular activities (Oliver, et al., 1998)

English and Yazdani (1999) in observations based on cooperative learning which took place in the Department of Computer Science of Exeter University reported that students have found the process time consuming.

However, Scifres et. al. (1998) found that their electronic groups spent less time communicating on-line. Sproull & Kiesler (1993) also concluded that the electronic group "need not to increase the total time they need to complete a project or to do it well" (p.69). Oliver seems to suggest that one possible solution for time saving is the provision of time limits for the activities by the instructor (Oliver, 1998).

### **2.2.2.3.1 TIME TO THINK**

However, computer conferencing appears to deliver an opportunity to the group participants in connection to time; that is the time advantage provided mainly by the asynchronous computer conferencing.

Participants in electronic groups have to write instead of speak in order to participate, therefore they have to think before they express their ideas. The act of writing teaches people to think. It is when students organise their thoughts that they increase their knowledge of a subject (Karayan & Crowe, 1997).

With the introduction of computers in collaborative learning, the issue of synchronicity has also been introduced and played an important role in group interactions. Group interactions in a face-to-face traditional group are all being delivered in a synchronous mode. Nowadays, the on-line group interaction depends in two different modes of communication, synchronous and asynchronous. The issue of synchronicity in an on-line group communication is quite vital. English and Yazdani (1999) reporting on the asynchronous electronic communication comment that it may suit some people and not others. Karayan and Crowe (1997) also notice that the participants of an electronic group need to compose and write their contributions. They argue, referring to Miller et al. (1994), that writing teaches people to think at the same time. Therefore students in the attempt to organise their thoughts in order to communicate, gain knowledge of the subject under discussion. As a result, Karayan and Crowe (1997) argue that "a discussion list is an excellent tool through which these skills develop in a natural, non-threatening atmosphere. The quality of responses to the discussion improves because participants have enough time to think, process and fine-tune their ideas".

Turoff (1989) also referring to the use of the computer conferencing in group situations notices that the asynchronous mode of interaction within a group is most important. He mainly focuses his attention on the aspects of time and place independence the asynchronous mode of group interaction has to offer. The group members can deal with a problem at any time they decide to do so regardless other people's involvement in the process. Therefore, the time independence will provide group members with the opportunity to deal with a problem on their own time. Additionally, that is something that would mostly suit people's different cognitive styles.

The immediate response time does not exist in asynchronous conferences the students take time to descriptive and detailed textual communications. Murphy et al. (1998) in a research project trying to determine patterns of communication used in a computer conferencing learning environment found students to have time to read, reflect, write and revise ideas. When someone is working asynchronously instant responses are not required, so students do

have time to think and reflect on their responses (Aoki, 1995), if that is their chosen learning style (Collins & Berge, 1996). "Participants sometimes tend to prepare their responses offline, when they have time to think and plan the content of their response" (McConnell, 1997).

Computer conferencing also allows simultaneously conversations, as there is not a need to wait for your turn (Harasim, 1987; McConnell, 1988). Therefore, there is little sense of interruptions (McConnell, 1997).

"Perhaps the most obvious difference between synchronous oral discourse and many types of written discourse is the ability to reflect on, edit, and shape the message before sending it, a characteristic abundantly evident in the CL messages" (Orlikowski & Yates, 1993).

#### **2.2.2.4 LACK OF VERBAL COMMUNICATION CUES**

People with different cultural backgrounds can communicate over on-line environments without noticing their surface-level differences such as language, tone of voice, the amount of silence in conversation, eye-contact, meaning of gestures, proxemics (the use of space) that are apparent and often become the cause of miscommunication in face-to-face situations (Aoki, 1995).

For Sproull and Kiesler (1993) computer mediated communication is likely to create a relatively unstructured communication, as it is firstly based on plain text. Secondly, the text is ephemeral, in the sense that messages can appear and disappear with the touch of a button, and there are no tangible artifacts. Sproull and Kiesler (1993) based on Short et al. (1976) and Kiesler et al. (1984) comment on on-line communication: "when communication lacks the dynamic personal information of face-to-face communication or even of telephone communication, people focus their attention more on the words in the message than one each other. Communicators feel a great sense of anonymity and detect less individuality in others. They feel less empathy, less guilt, less concern over how they compare with others, and are less influenced by social conventions" (p.40). Anonymity on the other hand, can bring the true self, as people are carefree of self-presentation (Spears & Lea, 1994).

CMC limited to textual communication eliminates the social cues (Sproull & Kiesler, 1986). However, it was also noticed that socio-emotional cues can be communicated through text-based interaction as people try to provide their own translations of non-verbal cues (Steinfeld, 1986), or incorporate expressions in order to compensate for the lack of face-to-face interaction (Tranz, 1980). People in order to compensate for the lack of contextual cues

use text pictures called "smileys", capital letters, asterisks, and exclamation points to indicate intentions, emphasise, and to communicate the tone of the text (Aoki, 1995).

Rafaeli and Sudweeks (1997) supporting Schudson's (1978) contention, argue that face-to-face conversation cannot be used as the standard of comparison for a CMC group conversation. For them interactivity is more of a continuum, a variable, not a condition. Interactions in computer conferencing are deprived of many traditional communication cues, such as facial expression, the absence of voice intonation, and the reliance upon printed text for cues to emotional content (Murphy et al., 1998).

The para-linguistic cues of face-to-face communication are missing in the text-based computer-conferencing interaction (Kaye, 1992). The written form of computer-based interaction and the elimination of the non-verbal or para-linguistic cues have been studied widely (Kerr & Hiltz 1982; Kiesler et al., 1984; Feenberg, 1989).

Computer conferencing eliminates all non-verbal channels (McConnell, 1997). For Hettinger (1995) the use of CMC in a course provides for discursive feedback stripped of all the roles, gestures, body language, and other non-verbal forms of interaction that colour meaning.

However, in some cases the text-based nature of computer conferencing enhanced by the absence of physical and social cues is also thought to help students focusing their attention on the content of the messages (Harasim, 1987a, Harasim, 1987b).

### **2.2.2.5 SENSE-MAKING**

Sense-making names a theory and the process of how people:

- reduce uncertainty or ambiguity;
- socially negotiate meaning during sensemaking events.

Rice-Lively (1996) carried out a study in two different university settings separated by hundreds of miles but linked by teleconferencing with the aim to explore the social sense-making and cultural patterns of behaviour and interaction among the class participants. It was found that teleconferencing diminished social interaction and sense-making for the following reasons:

- CMC messages appeared to be incomplete because teleconferencing omitted socio-emotional cues important to communication and confused individuals' understanding of events or situations;

- confused participants because of the transparency or the opacity of the technology;
- omitted contextual information from the message.
- the absence of sensory (intuitive and perceptual senses) information and social cues during teleconferencing dramatised and exaggerated behaviours and attitudes leading to misunderstandings and conflicts.

Students tried to facilitate social interaction by inventing ways to communicate more effectively during teleconferencing interactions by seeking social sense-making interactions. Other participants sought social sense-making interactions in small groups in the face-to-face setting conducting conversations beyond the reach of the microphone or the camera.

Nunamaker (1997) points out the need for research in the area of how teams make sense of vast quantities of information that are available on-line. Hiltz and Turoff (1992) suggested a number of key structures and procedures to help groups to organise and share information in computer conferencing. These procedures include: segmentation into separate group threading communication structures called "conferences" that are organised by topic, summarising, filtering, and indexing procedures, use of keywords, simple search engines, voting, scanning and summarisation features, automated reminders.

On-line environments support electronic conversations that expand and branch, but provide few supports for drawing together discourse in meaningful ways. This can have a negative effect, both on the learner's efforts to synthesise ideas, and on collaborative processes, which become increasingly fragmented as discussion threads, and individual interests diverge (Hewitt, 1997). Therefore, computer conferencing lacks in supporting the convergent thinking process (Eastmond, 1994; Hewitt, 1997). Hewitt (1997) emphasises the need for computer conferences to support these processes highlighting the need for adequate design of software.

Turoff (1991) uses the term "discourse structure" which is defined as a template for a discussion structure allowing individuals to classify their contributions into meaningful categories, structuring their relevance and significance according to the nature of the topic, the objective of the discussion, and the characteristics of the group.

Turoff et al. (1999) suggest that the use of conceptual maps needs to be taken into consideration in the design of CMC systems. CMC systems with tailored content oriented discourse and visualisation structures that would categorise the group discussions could allow larger groups to collaborate effectively and they could serve the needs of three different communities at the same time that of investigators, practitioners and learners engaged in collaborative learning processes.

Donath et al. (1999) recognised the inability of on-line text-based conversations to convey many kinds of social information, such as conversational tone, patterns of activity, size of the conversational group. Therefore, they focused their research on creating "representations highlighting social information and helping people make sense of the virtual social world". On the belief that asynchronous discussions are persistent and synchronous chats more ephemeral they provide as a solution the use of graphical representations of on-line conversations, focused on two projects namely Chat Circles and Loom. The graphical interfaces can show the size of the audience, identify salient data, represent each participants by a coloured circle that fades in periods of silence and also pulsating reflecting turn taking. Their system also has the ability to create visual archives, called conversation landscapes, representing each participant's activities and managing to create snapshots of an entire conversation.

#### **2.2.2.6 KEEPING A RECORD OF ACTIVITIES**

As Feenberg (1989) commented "a group which exists through an exchange of texts has the peculiar ability to recall and inspect its entire past" (p. 25). Especially, the asynchronous mode of group communication provides the group with the advantage of record keeping database where all group contributions are kept and group members are provided with the ability to recall or link ideas expressed within the group. Therefore, the potential for putting all remarks in context exists making people feel more comfortable with what they say (Martin, 1997).

Rimmershaw (1999) in a study of undergraduate courses using computer-based conferencing system remarks that course participants found that "the conferencing made collaborative learning visible-through the record of responses and dialogue in the conference, or seeing through ones own contributions chosen by other course members as food for thought for the exam" (Rimmershaw, 1999: 195). Or copy conferences in their folders and organise them as they wished (Rimmershaw, 1999).

Kaye (1992) commented that the record of messages of the group member's contribution can be used as a basis for reflective analysis. However, the development of multiple threads during the discussion process can create problems for the effective communication among the group members.

Orlikowski & Yates (1993) in their study also recognised the importance of the record keeping in the written communication. "Interviews highlighted another feature of written text available in electronic mail and relied on by the CL participants: a record of the interaction.

Electronic mail provided, as one participant noted, "a transcript at no effort." The message transcripts were, as we have indicated above, archived electronically and accessible to all interested parties in electronic or printed form. This feature was critical to the participants".

For Albrektson (1995) one of the advantages of on-line seminars is that all contributions can be preserved by thread-topic, saved, edited by participants and therefore become permanent records for future reference.

### **2.2.2.7 INFORMALITY**

It has been demonstrated by the literature that CMC promotes lower degrees of conventionality and formality (McGuire et al., 1987; Weisband, 1992). It seems that people feel more comfortable participating to a greater extent in CMC and informality has been encouraged when they were able to mask their identities. Jaffe et al., (1999) supported that a person given the opportunity to manage his or her identity will be more motivated and the text-based communication might reduce inhibitions due to the social expectations which narrow socio-emotional and relational discourse.

Rimmershaw (1999) in a study of an undergraduate course using computer conferencing systems to support collaborative practices noticed that: "the writing done in the conferences, being non-assessed, was in some respects closer to the informality of seminar talk, than to the formality of essay writing. Taking that informal writing seriously, for example by using quotations from it as the basis of the examination, represented a move towards acknowledging a wider set of sources of knowledge and ideas than those available in published professional writing. Taking this direction further leads to acknowledging other people's spoken ideas and formulation, from public lectures and conference presentations, seminars and group discussion, and private conversations" (p.199).

Martin (1997) found e-mail helping to eliminate the difference between co-operating teachers and college supervisors in terms of student teachers' perceptions and insights into the student teaching experience. For Martin (1997) e-mail, laying between the formality of writing a letter and engaging in informal oral conversation, seemed to have provided the medium through which students and teachers can feel more comfortable about opening up. Martin (1997) remarks that "what one writes to another via e-mail is generally restricted to viewing on a computer monitor, and as we tend to treat images on a television screen, so we tend to treat words on a computer monitor: we do not take them too seriously".

Orlikowski and Yates (1993) in a study investigating linguistic and textual patterns in asynchronous electronic communication of a task-oriented group found messages reflecting

the interactivity and spontaneity of oral discourse. Messages suggested informal conversations and use of syntax seemed closer to casual speech than to written language.

#### **2.2.2.8 PRECISION**

According to McCreary (1989) computer mediated discussion is based on the written communication, therefore more than any other form of communication requires a high degree of precision, with the use of clear and restrained expressions, and thought organisation.

According to Harasim (1990) "metacognitive skill requires the opportunity to make explicit to oneself the aspects of an activity that are usually tacit—for example, expressing the thinking processes by which a decision or conclusion is reached, or the strategy for accomplishing some task. The text-based environment is such a narrow bandwidth of information that, to compensate, clear and explicit articulation is essential for group interaction" (p. 49).

#### **2.2.2.9 IDENTITY AND USE OF PSEUDONYMS**

Pseudonyms are often used in computer conferencing when people wishing to alter or simply hide their identity. Jaffe et al. (1999) commenting on CMC environments suggest that they assist the manipulation of identity because they are virtual forums, "that is, social environments constructed through the transmission of audio-visual information across physical distances. Virtual contexts are ethereal and therefore distinct from "real" contexts in which one is in real physical proximity of one's fellow communicators" (p. 224). Therefore, pseudonyms can be employed by CMC communicators to mask their identity protecting themselves from reactions to the expression of their views, and allowing them to be other than themselves. Additionally, the use of pseudonyms can be a means of managing identity, since names imply gender and ethnicity (Jaffe et al., 1999). Studies in the use of pseudonyms in connection to gender found mixed results, suggesting that the question of CMC decreasing gender differences through the use of pseudonyms still remains open (Selfe & Meyer, 1991; Jaffe et al., 1999).

Bechar-Israeli (1995) studied the use of nicknames in IRC speaks about a new genre of communication being developed. "This genre combines written and oral features, as well as uniquely digital ones, blends different linguistic registers, and disregards the conventional rules of the language. It legitimises any form of expression, provided it is understood by its readers. This new, frontier-like medium fosters new forms of playfulness, including play with nicknames. The IRC community has a high awareness of language and uses it in a virtuoso



manner. We have seen that this virtuosity is often expressed through deliberate violation of conventional linguistic norms". The use of nicknames can serve many functions as they announce willingness, become part of our personality, are recognisable by the ones we are interacting with, are the key to make friends (Bechar-Israeli, 1995).

Anonymity may also allow one to express the authentic self without worrying about self-presentation (Spears & Lea, 1994).

### 2.2.2.10 NETIQUETTE

Rospach (1994) provides a number of guidelines on how to use Usenet groups "politely", "effectively" and "efficiently" including some interesting points of netiquette:

- *Never Forget that the Person on the Other Side is Human* (Situations arise where emotions erupt into a verbal free-for-all that can lead to hurt feelings)
- *Be Careful What You Say About Others* (information posted on the net can come back to haunt you or the person you are talking about)
- *Be Brief* (the longer you make your article, the fewer people will bother to read it)
- *Your Postings Reflect Upon You -- Be Proud of Them* (make sure each posting is something that will not embarrass you later)
- *Think About Your Audience* (try to get the most appropriate audience for your message, not the widest)
- *Be Careful with Humour and Sarcasm* (without the voice inflections and body language of personal communications, it is easy for a remark meant to be funny to be misinterpreted)
- *Summarise What You are Following Up* (when you are following up someone's article, please summarise the parts of the article to which you are responding).

Ferrara et al. (1991) in an empirical examination of a corpus of written dialogues between 23 experienced computer users found language containing features of reduction, such as omission of articles, subject pronouns and copula. Therefore, they concluded that real-time computer language displays features of both written and spoken language, suggesting that is hybrid. They comment that this new type of written communication is unique and "will proliferate in the future, perhaps even influencing or outdating the stylist conventions of traditional writing styles" (p.30).

## **2.2.3 PARTICIPATION ISSUES IN CMC**

### **2.2.3.1 INTRODUCTION**

Modern environments such as teleconferencing systems offer better opportunities for participation in the group. Time independence and access opportunities allow students to participate and create more overall productivity in the class (Mizell & Carl, 1994; Harasim, 1990). Group participants are, in a way, place independent; they can overcome constraints of time, distance and weather conditions (Anderson et al., 1993; Harasim, 1990). Especially, the asynchronous mode of communication allows users to participate at convenient time and pace as participants can respond immediately or allow time to reflect and compose their contribution. Therefore, the quality of participation can be improved (Graham & Scarborough, 1999). Learning does not require any more the social interaction of a face-to-face group. "Learning is becoming both personal and participative activity. It is no longer something that requires a group activity, in which participation is limited to the immediate social interaction" (Blakey, 1996: 18). According to Burgstahler (1997) new environments provide the instructor with the challenge to ensure active participation in the classroom. The Internet is an environment that naturally promotes engagement by the learners, as her students were found to participate more in the class discussion when the course delivered electronically than they did in the traditional class.

### **2.2.3.2 QUANTITY VERSUS QUALITY**

There appears to be a lack of clarity about the meaning and the assessment of on-line participation in the literature. Nevertheless, it seems that requirements for participating in an on-line group are mainly based on two factors: quantity and quality of messages (inputs). The most frequently used indicators of quantitative participation include the number of messages transmitted, length or size, frequency of inputs, the duration of consultations and the number of lines of text transmitted (Henri, 1992; Waggoner, 1992). Quality, on the other hand, deals with the content of each message referring to focus, arguments, information/insight, use of references, etc (Harasim, 1993a).

Henri (1992) stresses the focus of research on the quantitative data gathered by other researchers (Ellis & McCreary, 1985) and points out that "research in computer conferencing content is usually restricted to the gathering of quantitative data on participation" although it would have to be focused on the content analysis as well (p.122). Additionally, other researchers stress the need for a focus of the research in qualitative aspects of participation and variables affecting it. "Teachers may analyse the nature and the number of the comment,

questions asked and the frequency of the participation. However, teachers needed new evaluation methods and tools which will help them to evaluate the student comments” (Marjanovic, 1999: 137). Mason (1991a) also points out that "very few researchers tackle the difficulties of analysing the educational quality of conference interactions . . . the taint of subjectivity is so threatening, that most computer conferencing research stops with quantitative analyses of messages . . . Conclusions as to the revolutionary potential of computer conferencing are, therefore, often drawn with scarcely a mention of the actual content, much less the value, of the interactions" (p. 161).

Henri (1992) has presented an analytical model that has been designed for use by the educators in order to obtain a better understanding of the learning process. One of the five dimensions of Henri’s model (1992) is participation including two types called “overall” and “active” participation. “Overall” participation mainly deals with the total number of messages and accesses and with the duration of connection for educators and learners. Indicators used in overall participation are based on quantitative data supplied by the server. The second type of participation called “active” participation is based on the number of statements and contributions directly related to the learning process. Indicators used in this type of participation are mainly statements and students’ references (implicit or explicit) to each other's messages and related to the formal content of the course (Henri, 1992: 125). However, some of the messages used in the quantitative analysis contain little information and others contain several paragraphs with complex arguments. Therefore, these cannot be used as precise measures of active participation. So, Henri’s proposal suggested dividing messages into statements corresponding to units of meaning, and using these as the counted units measuring active participation.

Based on the above categorisation quantitative data provides information on the importance of the educator in the learning process. The data shows how many of the exchanges are related to the learning process, the type of conference the students are most active, or prefer the most. Data on participation can correct interpretation on message content analysis, tell us what levels of collaboration and autonomy are at work in the learning process, how satisfactory the virtual environment is set up and if it meets the needs of the students. He concludes that it is time to exchange quantitative approaches for qualitative ones to “analyse the interactive exchanges of CMC and to demonstrate the effects and advantages of interactive exchange in learning” (Henri, 1992: 126). For the above reasons, if we want to provide an accurate picture of the student’s participation, it is not sufficient only to count the number of messages as the student’s input.

Hiltz (1986) found greater student-to-student interaction in computer conferencing in comparison to face-to-face interaction and less teacher-to-student interaction. Harasim

(1987a,b) in her studies wishing to detect the effects of computer conferencing on support of active learning, also found active participation enhanced. Davie's (1988) results are similar to those of Hiltz (1986) and Harasim (1987a,b). Hiltz's (1990, 1994) also found greater participation in computer conferencing in comparison to face-to-face interaction. Hiltz (1990) added another parameter in the effectiveness and outcomes of computer conferencing. Motivated and well-prepared students, with adequate access to equipment, have more chances for active participation and are the ones who would take advantage of the benefits of computer conferencing. Harasim (1993a), in an article reporting on applications that have been analysed on both graduate and undergraduate courses based on collaborative learning activities found that:

- active participation was high even compared to face-to-face participation,
- students who characterised themselves as “passive” in the face-to-face situations reported that “asynchronicity enabled them to participate more actively and effectively” (Harasim, 1993a : 125)
- student interaction was not only significant in terms of input but also in quality of the messages.

Albrektson (1995) conducted an experiment wishing to investigate the possibilities of an on-line mentored seminar with the aim of simulating a geographically diverse group based on an asynchronous mode of communication. The results of the experiment had exceeded the researcher expectations in all areas, especially because the test population has been characterised as ‘ignorant’ and ‘unmotivated’. It was found that students:

- started interacting with each other with considerable “passion”, and they rushed into “furious debates” on thread-related issues,
- participated more than it was required weekly,
- student-student interaction grew sufficiently,
- would support their arguments with citations from the literature,
- were going beyond “absorption of information and were actively synthesising it with their understanding of the present”.

For Burgstahler (1997) the instructor is the one to ensure active participation by all students. She found that her students regularly made comments that they participated more in class discussions when the course was delivered electronically than they would in a traditional class. Albrektson (1995) also found the quality of the on-line discussion superior.

Trying to identify the reasons why the quality of the students' participation was found to be quite high, each researcher have given their own interpretations. According to Harasim (1993a) "on-line displayed fewer extremes of typical face-to-face class activity such as excessive or dominating input by a few and little or no participation by everyone else in the class. Cyberspace environments such as educational computer conferencing do not entirely eliminate domination by a few more vocal participants. What was new and different is that conferencing ensures that dominance by a few does not exclude the ability of others to have their say" (p.124).

For Albrektson (1995) the fact that the quality of the online discussion was found to be high can be explained based on the following: each student had access to the whole discussion thread, students knowing that their contribution would be viewed by the whole group tried to be careful about their proposals, to support them with persuasive arguments and to research them before presenting.

However, active participation does not always take place in the on-line group, some of the participants are just happy to follow the conversation the other group members are having. McConnell (1999) calls that "vicarious" learning where participants are only able to read, follow and observe the discussion of the others. And he notes that collaboration requires the active involvement of the participants.

For Graham and Scarborough (1999) active participation in the group enhances the procedure of learning. However, "a learner is regarded as present online only when he or she makes a comment. "Lurkers" that is those who read but do not comment, are not regarded as part of the learning environment" (Graham & Scarborough, 1999: 2).

For Burgstahler (1997) class participation on-line can also be required in a class offered via the Internet. She tried to find a solution to "to keep communications lively and prevent some students from just "lurking" (observing without participating)" requiring each student to contribute at least one comment (i.e., e-mail message) to the discussion of each lesson.

### **2.2.3.2.1 CONTENT ANALYSIS**

As has already been mentioned, the bulk of the literature has used quantitative methods in order to test and measure student's participation in computer conferencing. However, a part of the literature has been dealing with the content analysis of computer conferencing as a measurement of student's participation. Mason (1989) conducted a case study on the use of computer conferencing at the Open University. She tried to analyse the "educational quality" of computer conference inputs, concentrating mainly on the identification of discussion

threads. She came up with several types of student's inputs that refer directly to the content of the messages: the use of prior experience, the use of references, the introduction of discussion topics, the use of summaries and questioning.

Hansen et al. (1991) analysed the content of the discussion of computer conference messages in a large group of college students. They concluded that students did not measure up to their criteria of collaborative learning through computer conferencing as:

- students did not see computer conferencing as a forum for discussion, but rather as a place for expressing and stating opinions,
- the percentage of participation of each student at the same topic and number of arguments or comments at each thread was very low,
- little evidence of controversy and use of references on each other's inputs.

Webb et al. (1994) and Newman et al. (1995) developed a content analysis method for evaluating the quality of group learning in both face-to-face and computer mediated communication. They developed their own set of "paired indicators", based on simplification of Henri's (1992) pairs and of Garrison's (1992) stages and on their experience of using computer conferences. Their indicators include: relevance, importance, novelty, new info, ideas, solutions, bringing outside knowledge/experience to bear on the problem, ambiguities: clarified or confused, linking ideas-interpretation, justification, critical assessment, practical utility (grounding), and width of understanding (complete picture). Based on these indicators Newman et al. (1995) conducted an experiment measure critical thinking during group learning. The results of the experiment indicated that:

- both face-to-face and computer conferencing seminars showed critical thinking,
- more positive ratios of important statements and linking ideas were found in computer conferences, but less for novelty.

In an attempt to explain the results, Newman et al. (1995) charged the asynchronous mode of computer conferencing for discouraging students from contributing new ideas. On the other hand, the computer conferencing system made it possible for the students to look through previous messages before making a comment, and then link ideas together. In a face-to-face situation, the students would have to remember other group member comments after the discussion has moved on.

### **2.2.3.3 EQUAL/ENHANCED PARTICIPATION**

It has been seen by a few studies that computer-mediated communication can provide a forum allowing chances of more equal participation to the participants (Siegel et al., 1986; Hiltz et al., 1986; Easton et al., 1990), participation that would assure equality and less hierarchical structures (Kiesler & Sproull, 1987). Harasim (1993a) not only found the overall volume of messaging high but also commented it was "fairly distributed among most students" (p.124). Kiesler et al. (1984) also found that electronic groups participated more equally compared to face-to-face groups. Other studies have suggested that anonymity the on-line communications provide can result in more equal participation in the group (Zigurs et al., 1988).

Harasim (1987, a, b) has also found that the absence of social and physical cues and the nature of text-based computer conferencing promotes egalitarian communication. Harasim (1990) also suggests that the asynchronous mode of computer conferencing is promoting equal participation, as its nature prevents domination by only a few people.

Kiesler (1992) suggests that qualitative changes can be made in social contacts and group dynamics as can be made in through the use of electronic groups. In a series of experiments in Carnegie Mellon University where computer-based decision making of small groups was compared to face-to-face discussion, it was found that "participants talk more frankly and more equally. Instead of one or two people doing most of the talking, as happens in many groups, everyone had a say" (p.154).

Based mainly in Kiesler's findings Waggoner (1992) argues that these findings may suggest that computer conferencing may be "conductive to use in a collaborative learning activity. Further because group activity is observable through this medium and other participation variables can be identified with some predictive value, the possibility exists for a comprehensive evaluation of a collaborative learning activity conducted in a computer conferencing environment" (p. 142).

### **2.2.3.4 LIMITED PARTICIPATION**

Mason (1991a) in her study analysis of an Open University course has found that only one third of the students have participated actively. However, she also found that only a small number of messages were described as "islands" and the majority of the messages were "webs", using them as an indicator of interactivity. "Islands" are messages that stand alone with no response and "Webs" develop as a message welcomes more than one response.

Selfe and Meyer (1991) in their study tried to test if computer conferencing would have any effects on the promotion of the equal communication. The study mainly focused on participation by gender and profession (status). No significant promotion of egalitarian communication was found.

However, Aviv and Golan (1998) in a study evaluating students' behaviour in a tele-learning Computer Science course and concerning the pedagogical communication patterns, had found participation in electronic discussions "passive". In fact it was found that although quite a high percentages of the students had read at least some of the messages, only half of them participated by expressing their opinion or raising a topic for discussion. The researchers then correlated the student distances from the study center to their participation rates and paid a closer examination to the structure of the discussions. It was revealed that:

- participation has been affected by the distance of the participant from the study center. "The farther the students lived from a study center the greater was his/her participation in the discussion and the greater was the extent to which the telecommunication technology was perceived as helping him/her in studying the course material".
- "the relative usage of the electronic decreases dramatically when the collaboration is less focused and not lead by a team leader" (Aviv & Golan, 1998: 208).

## **2.2.3.5 FACTORS AFFECTING PARTICIPATION**

### **2.2.3.5.1 ANONYMITY**

The modern group support systems and especially the synchronous mode of such systems provide all participants with equal opportunities of contribution, because of its egalitarian and anonymous nature (Marjanovic, 1999).

Selfe and Meyer (1991) in a research project tested how, and if, anonymity or even "pseudonymity" in computer conferencing, would encourage participation. It was found that the use of pseudonyms increased and encouraged participation, and open conversation about gender and status. However, the conversation was found to be dominated by men and higher status participants.

Marjanovic (1999) connected anonymity to international students' participation commenting that "anonymity enabled them to participate as equal participants in spite of their language difficulties in cultural and educational background although some of them commented that they sometimes needed more time to complete the required activity" (p.136).



Dillenbourg and Schneider (1995), observed that Usenet newsgroups constitute a rich ground for controversial discussions, where one can observe intensive debates. One can set as hypothesis that the existence of physical distance among the participants, the anonymous participation of the group members and the limited communication bandwidth (mainly text, no face-to-face) enable participants to engage into intellectual debate with fewer emotional consequences than in co-presence interactions. Other studies also suggest that anonymity in the on-line group can lead to more equal participation (Zigurs et al., 1988).

Researchers have appreciated anonymity as a warranty of equal interaction in the on-line group in general. However, others noticed that anonymity is less important in educational settings where evaluation procedures are less pressing (Jessup & Valacic, 1993).

### **2.2.3.5.2 COMPUTER COMMUNICATION SKILLS**

In order to be able to participate and perform in a computer conference course students need some basic computer skills to be able to manage files and documents, download material from the Web or even use the specific software that has been chosen by the course coordinator.

The importance of acquiring such basic computer skills to be able to perform easy tasks and manage the practicalities of a CMC based course was stressed in different studies (e.g. Foell, 1989; Anderson and Lee, 1995; Ross et al., 1995).

However, no researcher has studied the effects of limited computer skills on student participation before 1996. Ross (1996) conducted research on the influence of computer communication skills to investigate what happened to students with “weak” or “lesser” computer skills when they would enroll in a CMC course as opposed to students with “strong” or “high” computer skills. It was initially anticipated that students with weak computer skills would: miss important instructional events, lose precious time, have lower levels of task relevant contributions, have less influence on group products, and engage in less demanding learning activities. It was also anticipated that students with limited computer skills might have fewer chances for participation (Ross, 1996: 37-38). Evidence from Ross’ findings partly supported his initial hypothesis as it was found that:

- “lack of computer communication skills influenced students’ ability to access group discussions and impeded their ability to function as equal group members. There were a few occasions in which they missed instructional activities, they expressed anxiety and guilt about their computer skills”,

- however, “despite the technical difficulties they encountered, students with weak communication skills contributed as much as other group members”,
- “students with weak computer communication skills were as likely as those with strong skills to suggest a framework, volunteer for sections, identify materials, exercise procedural leadership, and complete their portions of the assignment”,
- finally, “students with weak communication skills were more likely to engage in argument contraction, the most productive form of small group learning” (Ross, 1996: 46-47).

Therefore, Ross' (1996) study indicated that computer skills only had a modest impact on student participation. However, four factors have been taken into consideration by the researcher that might have limited the study's generalisation. These factors dealt with the high levels of students' motivation, the availability of technical support that would solve the most of the problems, the “ethos of peer support emerging from the structure and content of the course”, and the low level of computer skills that were required by the course (Ross, 1996: 49-50).

#### ***2.2.3.5.3 FAMILIARITY WITH THE SUBJECT***

Other factors, apart from computer skills, that may affect participation in computer conferencing were identified in the literature, such as familiarity with the subject or "prior knowledge" or "previous related experience". Kerr and Hiltz (1982) have placed previous related experience among the basic skills for the use of computer conferencing in collaborative learning. In other studies, prior experience with the subject was found to have a positive effect on students' participation (McCreary & Van Duren, 1987; Ross, 1996).

#### ***2.2.3.5.4 LACK OF SOCIAL CUES AND PERSONALITY***

Waggoner (1992) cites personality characteristics along with basic values among the individual characteristics that might affect an individual's acceptance and use of a system in a collaborative learning situation. Traditional discussions tend to be dominated by a few students and, as a result, shyer students with opposing but equally worthwhile ideas may not challenge someone who speaks forcefully (Conlon, 1997). However, students with the most participation in computer conferencing were not necessarily the ones who dominated the class meetings (Harasim, 1993a; Alberektson, 1995; Rimmershaw, 1999). Authors often expressed their satisfaction when students with limited participation in face-to-face situations made considerable contributions in computer conferencing (Alberektson, 1995; Rimmershaw, 1999;

McConnell, 1990). According to Harasim (1993a) on-line interaction displayed fewer of the extremes of a face-to-face class activity. As she commented "cyberspace environments such as educational computer conferencing do not entirely eliminate domination by a few more vocal participants. What is new and different is that conferencing ensures that dominance by a few does not exclude the ability of others to have their say" (p.124).

Kerr and Hiltz (1982) identified a number of other psychological variables that might affect participation in a computer conference system such as personality, and communication skills. When people communicate they are not only exchanging information, they are also projecting an image of themselves. This projection of their image is likely to make them shy in front of other people. "Ephemerality" especially in electronic mail can reduce their fear and may make people to be more open (Sproull & Kiesler, 1986; Sproull & Kiesler, 1993).

Traditional collaborative classroom settings may create problems in passive or shy students who experience the stage "fright" every time they are required to present their ideas to their peers (Marjanovic, 1997; Marjanovic, 1999). Harasim (1993a) have found that students who characterised themselves as passive in face-to-face situations have reported that asynchronicity enabled them to participate more effectively and actively. Students who are observed to be quiet in face-to-face classroom environments can be more interactive in real time chats (Murphy et al., 1998). Harasim (1993a) and Bullen (1997) also connect active participation of shy people in computer conferencing with its asynchronous mode and the time allowance provided to the group participants.

According to Graham and Scarborough (1999) the absence of verbal cues in this new form of computer communication may provide limitations to the interaction of group members or create a feeling of unnaturalness. However, the lack of social cues in the on-line group may be considered as an advantage that could encourage shy students to participate. Albrekton (1995) points out that shy and reserved students expressed their satisfaction of having equal opportunities to interact and to make equal contributions. Conlon (1997) being involved in a project that encouraged student writing through engagement in on-line discussion groups, argues that on-line discussions can have several advantages over the traditional approaches. "Traditional face-to-face discussions tend to be dominated by a few students. Also, students who want to respond to a speaker's comments are affected (as we all are) by what they see and hear from that speaker. As a result, other, shyer students with opposing but equally worthwhile ideas may not challenge someone who speaks forcefully and with conviction. And all too often in traditional classroom discussions, a speaker's gender may encourage put-downs. In MOOville, the quality of an idea mattered most. Appearance and forcefulness were no longer barriers to participating in discussions. Instructors found that more students got actively involved in these online discussions".

Karayan and Crowe (1997) also argue that "one psychological benefit to an electronic discussion group is that it caters to the needs of all students". She categorises the student as "impulsive" and "reflective" learners. Impulsive learners have the "urge and the need to respond to every question or to make a comment on everything discussed in class". On the other hand, "reflective learners, need more time to process the question/issue before responding". Therefore "discussion groups act as equalisers of opportunity to participate. They give the impulsive learner time to calm down and the reflective learner time to put his/her thoughts together. Often those students who depend on verbal domination in class may be less wordy in writing and vice versa".

Murphy et al. (1998) found students, who were usually quiet in face-to-face classrooms, to be more interactive in real-time chats despite the "rapid pace of typing needed to stay current in a live chat" (p.251).

Rimmershaw (1999) connects student participation in the computer conferencing to:

- their confidence to the system, referring to the need of good technical support; and
- "high-profile participation on the part of the tutor, indicating that setting up the conferences was not just a way of fobbing students off was probably significant too. The tutor's collaboration in their discussions may have contributed to student's perceptions of the course principles as relatively credible" (p.199).

### **2.2.3.5.5 TECHNICAL PROBLEMS**

Experience of technical problems during computer conferencing is a theme coming in the literature quite often. Students using on-line facilities to collaborate with their peers often experience difficulties logging into the system (Graham & Scarborough, 1999; Harasim, 1993a; Ross, 1996), system crashes (Harasim, 1993a), software or hardware problems (Berge, 1997; Cifuentes et al., 1997), receiving information, and downloading messages (Ross, 1996). The above can result in a very time consuming procedure (Rimmershaw, 1999) or eventually the students could give up after several failed attempts (Ross, 1996).

Graham and Scarborough (1999) and Harasim (1993a) reported that one the greatest problems their students faced was access to the system and frequent systems crashes (Harasim, 1993a). McConnell (1990) reports that technical problems of both hardware and software nature obstructed student participation. Students find technical hitches off-putting, time consuming and eventually lost confidence in the system (Rimmershaw, 1999).

Yakimovicz and Murphy (1995) who based their study on a graduate course pointed out their students experienced software and hardware problems, and as a result they started making more formal contacts with each other. They also point out that problems seemed lighter if other course participants were experiencing as well and maybe in "reaction to these differences, a sense of group and of self arose from the attempts to overcome the technical barriers" (p.209). Ross (1996) relates the technical problems experienced by computer conferencing participants to the level of their computer communication skills commenting that "for students with weak communication skills even trivial problems loomed large" (p.44). Students with low computer skills may disappear from the conference entirely as they "felt victimised by the equipment" (Ross, 1996).

Research also indicates that convenient access to the on-line technologies results in the effective use of these facilities (Hiltz, 1990; Hiltz, 1993; Harasim, 1993a). Therefore, convenient access to the on-line technologies is considered to be an essential factor of an on-line course delivery (Harasim, 1993b; Hiltz, 1990, 1993). Additionally, the availability of good technical support was considered to be important (Rimmershaw, 1999). Others recognised the importance of having access to a CMC coach providing computer support for solving problems raised by the students (Ross, 1996; Ross et al., 1995) or even having a help desk (Phillips et al., 1988).

### **2.2.3.5.6 COURSE DESIGN**

Teachers in modern educational environments in the literature seem to see participation in an immediate relation to course design (Brown, 1997; Jonassen et al., 1993; Laurillard, 1993; Aviv and Golan, 1998). Participation issues need to be taken into account when educators are developing courses and software for collaborative learning with the use of computer conferencing. Gay and Lentini (1995) suggest the need for systems that use multiple modes to support a broad range of communication and design activities for the students. So, these multiple channels can encourage both monitoring and active participation and can facilitate clarifications, acknowledgements, information sharing, negotiation and the transmission of design information. Bullen (1997) in his case study of the effects of computer conferencing in participation and critical thinking identified pedagogical design as one of the main factors affecting students' participation. According to Bullen the pedagogical design involved four parameters namely: mandatory participation, pacing, no social activities and instructor's participation. Mandatory participation was found to have helped students to remain focused although it resulted in superficial participation being affected by the marking system. Pacing was achieved by having "regular online discussions with clear beginning and ending dates and

specific deadlines by which students were required to contribute. Student perceptions of how the pacing was handled in the course seem to indicate that it was only partially successful and that it may have had some unintended impacts on participation" (Bullen, 1997: 169) as it seems that some students waited until the deadline to contribute. Bullen also stressed the importance of including some kinds of social activities that allowed students to get to know each other before they began the discussions. Finally, the role of the instructor's involvement was discussed in connection with pedagogical design as students felt that the instructor's participation would also encourage students' participation.

### **2.2.3.5.7 GENDER DIFFERENCES**

According to Jaffe et al. (1999) some of the most controversial issues in the study of human communication involves "theories exposing differences in men's and women's communication patterns" (p.221). Studies of gender differences carried out in both educational and non-educational settings (McConnell, 1997). There has been a considerable discussion of gender differences in computer conferencing. A great number of studies dealt with women's access to new technologies (Durdell & Lightbody, 1993; Colley et al., 1995; Durdell & Thomson, 1997), gender and on-line identity (Spender, 1996; Turkle, 1996), gender related language use (Herring, 1993), use of pseudonyms (Selfe & Meyer, 1991; Jaffe et al., 1999).

Traditionally, men are considered dominating in mixed- sex conversations, being the talkers in real life. Jaffe et al. (1999) explained the occurrence of gender differences based on the assumptions of developmental psychologists that communication and social activities are a result of the way children have been raised in largely sex-segregated peer groups.

Studies in gender differences in CMC seem to be mixed. In some cases CMC environments were found to be an impediment for female participation and considered to be male dominated (Herring, 1994; Herring, 1993). Herring (1993) evaluated male and female participation in two academic electronic discussion lists over a year period. She found that "male and female academic professionals do not participate equally in academic CMC. Rather, a small male minority dominates the discourse both in terms of amount of talk, and rhetorically, through self-promotional and adversarial strategies. Moreover, when women do attempt to participate on a more equal basis, they risk being actively censored by the reactions of men who either ignore them or attempt to delegitimise their contributions. Because of social conditioning that makes women uncomfortable with direct conflict, women tend to be more intimidated by these practices and to avoid participating as a result...although the medium theoretically allows for everyone with access to a network to take part and to express their concerns and desires equally, a very large community of potential participants is

effectively prevented by censorship, both overt and covert, from availing itself of this possibility. Rather than being democratic, academic CMC is power-based and hierarchical. This state of affairs cannot however be attributed to the influence of computer communication technology; rather, it continues pre-existing patterns of hierarchy and male dominance in academia more generally, and in society as a whole".

Savicki et al. (1996) studied the group gender composition and group process functions on a randomly selected set of 30 on-line discussion groups. They were based on the hypotheses that groups composed of only men or women will represent extreme positions on several gender-related variables, while mixed groups will fall between the extremes. Additionally, women will behave consistently with maintenance or socio-emotional group process roles and men will behave consistently with task oriented roles. Results applied that men far outnumber women as participants in online discussion groups. However, results were mixed in regard to the relation of language choice and patterns and group gender composition. On the other hand, the expectation that groups with higher proportions of women would be conducive to group members' self-disclosing and seeking prevention and reduction of tension was not supported. There was a surprising number of messages that were not able to be categorised as participants used pseudonyms, initials or names of intermediate gender. Therefore, it was difficult to test the hypotheses with precision.

Barrett and Lally (1999) explored gender differences in a small mixed sex group of postgraduate learners working in a CMC environment. Transcript analysis suggested that "men and women behaved differently in the on-line learning environment in terms of the frequency, length and style of their contributions to group discussions" (p.59). Barrett and Lally (1999) also noticed that men's contributions were more numerous and longer in comparison to women's, including also greater levels of social exchanges. However, women appeared "to be more interactive than men, i.e. their messages included implicit or explicit references to previous contributions" (p.59).

Other researchers found that CMC enhanced participation for both genders (Herschel, 1994). McConnell (1997) studied patterns of interaction in small mixed sex groups of postgraduate students in computer conferencing using four approaches: allocation of speech turns (turn taking), patterns of interruption, choice and development of conversational topics, and length of exchanges. The findings support more turn taking by females, no differences in the average number of words entered, no major differences in direction of conversational topics, and no significant differences in the initiation of the conversations. Based on the results McConnell (1997) suggests that the medium of computer conferencing allows for a more democratic form of participation, commenting: "this group learning medium may offer new opportunities for female members of mixed sex groups. As a group, females appear to be able

to take more turns at speaking than in face-to-face settings. As individuals they have equal chance of speaking for similar length of time to males. They have equal opportunity for directing conversational topics, and on occasions appear to direct the conversations more than the male participants. Females therefore appear to be at less of a disadvantage in on-line discussions, at least in the contexts, which have been discussed here. However, males still tend to talk longest even in this environment, even though there is no difference in the average words entered by individuals generally, irrespective of gender" (McConnell, 1997: 360).

Ory et al. (1997) investigated male and female student use of and attitudes towards asynchronous learning networks, finding similar and positive attitudes. The few significant gender differences revealed that female students:

- used computers more often for conferencing with the instructor and other students but less often for exploring resources on the Web,
- found using computers to be slightly more difficult,
- were less likely to use personal computers in their apartment or residence hall room, and
- reported greater gains in their familiarity with computers after taking an ALN course.

Selfe & Meyer (1991) examined participation in computer conferencing by gender, profession, use of pseudonyms and the power structure. Previous studies have also investigated the effects of pseudonyms in computer conferencing (Kiesler et al., 1984; Cooper & Selfe, 1990).

Selfe & Meyer (1991) attempted to test if the use of pseudonyms would encourage participation. Therefore, they requested their research participants to use their real names for 20 days and then use pseudonyms for another 20 days. It was found that the number of messages increased significantly in the latter period of time. A result suggesting that the use of pseudonyms may have encouraged people to participate more. However, although the use of pseudonyms encouraged conversations about gender and power structure the conference was still dominated by men and higher status members. Therefore, they concluded that the use of pseudonyms did not result in more participation that was egalitarian. However, they suggested limitations to their study dealing with the small number of subjects and the low percentage of participants choosing to use pseudonyms.

Jaffe et al. (1999), using undergraduate students' discussion groups, also examined how the use of pseudonyms in CMC might have reflected motivation for gender-based status parity and "mitigated supposed gender-based communication differences associated with social



interdependence" (p.221). They observed that women had an increased tendency to mask their gender with the use of pseudonyms. Trying to interpret this finding, they commented that it reflected, "an effort to rectify an imbalance, felt by women, of social parity when interacting in mixed-gender situations" (p.230). Additionally, women demonstrated greater social interdependence than men did. Therefore, their prediction that CMC decreases gender differences through the use of pseudonyms still remains an open one.

Ford and Miller (1996) investigating perceptions of Internet use found some significant gender differences. Men were found to enjoy browsing around the Internet whereas women seemed relatively disorientated, using the Internet "for work purposes as opposed to personal interest", "only when they had to" and looking at "items when they have been suggested to them" (p.188).

Bullen (1997) summarised research on participation in computer conferencing up to 1997 (see Table 2.2)

<u>Study</u>	<u>Context</u>	<u>Findings</u>
Hiltz (1986)	undergraduate college	- greater student to student interaction than face to face
Harasim (1987a,b)	graduate university	-active participation - not dominated by instructor - high level of intermessage reference
McCreary & Van Duren (1987)	undergraduate/graduate university	- nature of participation changes depending on nature of students, course and familiarity
Davie (1988)	graduate university	- high level of participation - not dominated by instructor - high level of intermessage reference
Mason (1989)	undergraduate, distance education, open university	- low level of participation - low level of interaction - reasons for participation and nonparticipation investigated
Henri (1989, 1992)	professional	- low level of interaction - CC used to verify knowledge gained in correspondence material, not for discussion - use of clarification skills - surface-level information processing
Hiltz (1990)(1994)	undergraduate, graduate college, university	- greater participation in CC than face-to-face - greater student-to-student communication than in face-to-face - no relationship between sphere of control and participation
Harasim (1991)(1993a)	undergraduate, graduate university	-use of active questioning, elaboration and debate
Mason (1991a)	undergraduate, distance education, open university	- one third of students contributed actively - reflective, self-directed, active participation - "dialogues" and "webs" dominate
Selfe & Meyer (1991)	academic	- dominated by men and higher status members - pseudonyms increase participation but do not affect its nature
Hansen et al. (1991)	undergraduate college	- low level of participation - low level of interaction and collaboration - students tend to state unsupported opinions
Newman, Webb & Cochrane (1995)	undergraduate college	-evidence of critical thinking

*(Table 2.2- Summary of Research on Participation in Educational Computer Conferencing: Bullen, 1997: 70-71)*

## **2.2.4 LEADERSHIP ISSUES IN CMC**

### **2.2.4.1 INTRODUCTION**

A number of researchers and authors referred to the role of a possible leader in the on-line group. Different and alternative names were used in the literature referring to the role of the leader in on-line interaction, such as “coach”, “conceptual leader”, “production coordinator” (Ross, 1996; English & Yazdani, 1999), “moderator” (Kerr, 1986), “facilitator”, “motivator”, “mentor”, and “mediator” (English & Yazdani, 1999).

Leadership has been considered as an important factor in computer-mediated communication. Kerr (1986) firstly stresses the need for a “strong leadership” in on-line conferences. For Kerr if an on-line group wishes to be successful there is a need for “strong” and “active” leadership. The lack of such a factor in the on-line group could lead to the failure of an on-line conference. On the contrary, for McConnell (1992) “strong” leadership is unnecessary and unhelpful, as identification and setting of the group goals have to be achieved democratically by the group members. Additionally, McConnell also considers that the handling of an on-line discussion (therefore leadership) is not a task needed to be performed by the tutor, with the condition that active participation of the group members is keeping them informed of what is happening in the group.

The role of the leader in CMC traditionally has been given to the tutor of the electronic group (Kerr, 1986; McConnell, 1992). However, McConnell (1992) goes a step further adding that if it is not the tutor who moderates the on-line conference then it is “assumed that someone has to take on the job of moderating” (p.64).

For Waggoner (1992) evaluation of the leadership is “elusive”. He argues that leadership is to be judged based on the results of research and in a combination of different measures such as knowledge attained, or the perceptions of the participants regarding a productive learning experience, that can provide us with a complete picture of the situation. The main role of the “moderator” would be to keep an eye for achievement of the group’s goals. On the other hand, the role of the moderator is to facilitate discussion among the group members (Feenberg, 1986). Additionally, a conceptual leader would emerge in the group to suggest a structure for the response, listing themes or issues to be addressed in the group (Ross, 1996).

### **2.2.4.2 STUDENT- MODERATOR**

The majority of the literature on the moderator's roles refers to them as a part of the role of the on-line teacher or tutor. Mason (1990) comments that students can also take upon some of

these tasks and initiatives seeing it as a sign of active, self-directed learning. Mason (1991b) defining the three categories of roles (organisational, social and intellectual) needed to be carried out by the on-line moderator points out that they are not necessarily carried out only by the on-line tutor. In addition, Feenberg (1986) suggests that the more group participants share the moderator's roles, the more the interaction would be engaging and successful.

However, in a few cases in the literature, suggestions found relating to the student's role as an on-line moderator. Murphy et al. (1998) in their study addressed ways in which computer conferencing influenced interaction and collaboration patterns among students of a graduate course using both synchronous and real-time communication text-based systems. They concluded that computer conferencing instructors should incorporate roles of "moderators" and "participants" and that moderators and participants of conference discussions require different roles.

"Moderating a discussion requires risk, which is related to levels of self-confidence. Some student moderators worried that their classmates would be critical to them, the technology would fail, or they would not have effective leadership skills; whereas participants needed to do no more than contribute to the discussion" (p.257).

Oliver et al. (1998) did a qualitative research study investigating learning behaviours and factors influencing the nature and the types of student interactions in complementing a WWW-based learning activity. They suggest in their discussion that the group composition (the ability of the students to choose their partners) may lead to more efficient partnerships and provide a "buffer to lessen the likely leadership role of the more experienced user" (p.281).

Aviv and Golan (1998) in a study evaluating student behaviour in an on-line learning Computer Science course concerning pedagogical communication patterns found that students differentiate between the personal dimension of communicating with others and the "group" dimension, which enables true collaborative work. They also found that the usage of the electronic group forum decreases when the collaboration is less focused and preplanned. Additionally, there was no team leader to guide the collaboration in the group. Aviv and Golan (1998) conclude that the extent to which students collaborate via electronic means depends on the performance of the "trained team leader" who could take up "creative leadership" roles. However, it has to be noticed that Aviv and Golan (1998) see leadership roles to be performed by the class teacher or tutor and not from a group member.

Scifres et al. (1998) investigated experimentally whether electronic communication methods that link geographically dispersed students would enhance or detract from the learning experience. They have tested seven hypotheses of these differences on critical thinking, group processes and learning outcomes. They found that electronic groups were more likely

to be dominated by one or two members than traditional groups. "Groups are more likely to experience unevenness in the area of displayed leadership, indicating domination by certain group members" (Scifres et al., 1998: 250). Their views differ from the bulk of the literature, which supports that electronic communication promotes democratic interaction.

Ross (1996) studying the influence of computer communication skills on participation in a computer conference course found that the so-called "conceptual leader", the student who developed the framework for the group product, was a person with higher prior knowledge.

### **2.2.4.3 TEACHER- MODERATOR**

Harasim, (1993a) argues that although modern environments are learner-centered they do not reduce the demands on the on-line teacher. For her "the instructor must monitor and remain current with the on-line class discussions and activities to monitor for inaccurate information as well as to respond to particular issues or requests and make contributions to the discussions" (p.128).

Modern distance learning environments provide a dual challenge for the teachers who have to familiarise themselves with the new technologies and at the same time provide appropriate training of new technological facilities to their students (Murphy, 1995).

A large part of the literature deals with teacher's involvement to the course design, provision of training, content knowledge (Gunawardena, 1992; Hillman et al, 1994; Thrach & Murphy, 1995; Murphy et al., 1997). However, it is beyond the scopes of the current literature review to go into the fields of course design and effective planning by the instructor.

Electronic collaborative learning requires the teacher to play more the role of the participant in the learning process (Nunamaker et al., 1997). For Gunawardena (1992) the changing role of the teacher in computer conferencing is to guide and support the learning process. The teacher's role would also involve the organisation of the tasks, the topic, and the timetables (Harasim et al., 1995).

A part of the literature refers to the role of the moderator in computer conferencing that is used to promote student's learning. According to Rohfeld and Hiemstra (1995) "the responsibility of keeping discussions track, contributing special knowledge and insights, weaving together various discussion threads and course components, and maintaining group harmony" (p. 91). Rimmershaw (1999) also requests the tutor's active and "high profile" participation in the computer-based conferencing system. As the tutor's collaboration in the student's discussions "may contribute to the student's perceptions of course principles as

relatively credible" (p.199). According to Marjanovic (1999) the facilitator's role is one of the key roles in preparation of the electronic collaborative classroom. Marjanovic differentiates the teacher's role from the facilitator's role. "The facilitator works with the teacher and gathers information about the class to be organised and provides information about the technology. When the teacher becomes confident with technology, s/he may assume the role of the facilitator as well. Since a collaborative learning activity may be designed in many ways, the facilitator and the teacher together decide which tools to use and how to use them" (p.132). Also the teachers are required to have good problem solving and team management skills.

According to Murphy et al. (1998) the instructor of the computer conferencing is responsible for taking up a number of different roles:

"Through computer conferencing, an instructor may provide guidance to students privately, without drawing the attention to the action by using e-mail to post announcements tactfully to students. We found that in addition to giving prompt feedback, providing advance planning and clear structure, and planning for hardware and software training, the instructor must play a variety of roles including those of facilitator, coach, guide, expert resource, and arbitrator" (p.256).

For English and Yazdani (1999) the facilitator that could be the tutor or the course leader has an important role to play trying to strike the desired balance of motivator, mentor and mediator. For them such role is so important that can affect the success or failure of a learning group.

#### **2.2.4.4 MODERATOR ROLES**

A number of writers provide us with a description of the roles needed to be carried out by the moderator or facilitator of the computer conferencing (Feenberg, 1986; Brochet, 1989; Davie, 1989; McCreary, 1990; Eastmond, 1992; McMann, 1994; Paulsen, 1995; Berge, 1995). As identified by Collins and Berge (1997) the roles of the on-line moderators appear to have been articulated mainly from individuals, depicting personal experiences of people who have performed those tasks on-line.

Brochet (1989) identifies the importance of moderation to the success of computer conferencing discussing the six roles the moderator has to undertake such as: the "goal setter" deciding on the plans and schedule of the conference; the "discriminator" differentiating valuable and less valuable ideas; the "host" taking up the task of encouraging participation; the "pace setter" being responsible for promoting co-operation; the "explainer" passing along messages and raising stimulating questions; and finally the "entertainer".

As McMann (1994) points out the majority of the roles that have to be performed as part of the tasks of the moderator are actually quite similar to the face-to-face moderator's tasks. According to Mason (1991b) the role of the computer conferencing moderator involves responsibilities at both technical and educational level. Mason mainly focuses on the discussion of the educational role of the on-line moderator that involves three categories: the organisational, the social and the intellectual. The organisational role involves the setting up of the conference agenda: like setting the objectives of the discussion, the timetable, the procedural rules and the decision-making norms. The social role involves the creation of a social environment by sending welcoming messages and encouraging participation by providing feedback and being friendly. Finally, the intellectual role is considered to be the most important one by Mason (1991b), that is directing (Davie, 1989) and focusing the discussion on the vital points emerging; the synthesis of the points made by the participants (Hiltz, 1988); the provision of a summary and interpretation of the on-line discussion (Feenberg, 1989).

Hiemstra (1994) referring mostly to the various limitations facing those in using computer conferencing points out that the on-line teacher acting as the facilitator needs to:

- provide appropriate time for initial tasks and adequate technical support,
- make sure that their instructional materials are well designed and that learners are provided with adequate information management skills,
- provide learners with appropriate instruction, training, and continuous guidance,
- provide learners with adequate information and advice in order to be able to communicate via CMC,
- use effectively Feenberg's (1989) "weaving" skills to keep discussion targeted,
- support student's reflective and critical thinking by engaging them in special activities such as journal writing, interactive reading and discussion, and providing feedback,
- support and encourage participation in various ways.

Berge (1992) initially suggests that the moderators may take on various roles including:

- facilitator (keeps list "on track"; group leader),
- manager (administrator, archiving, deleting/adding subscribers),
- filter (deciding upon on-topic posts; increasing signal/noise ratio; deletes libellous posts; may delete jokes),

- expert (answering Frequently Asked Questions; expert in the list's field, for example a manufacturer's representative),
- editor (text editor, digest posts, format posts),
- promoter (asks questions of the list subscribers to promote discussion),
- marketer (promotes/explains list to potential subscribers),
- helper (helps people with needs -- more general than expert),
- fireman (takes "flames" or ad hominem attacks offline).

Berge (1995) also reviews the literature on the topic and lists the roles, tasks and functions of the computer conference moderator. These roles as have been listed by Berge (1995) include the role of: "assistant, consultant, coordinator, discriminator, editor, entertainer, expert, explainer, facilitator, filter, firefighter, goal setter, helper, host, intermediary, leader, lecturer, manager, marketer, mediator, mentor, observer, pace-setter, participant, promoter, social host, provocateur, and tutor" (p.24). However, Berge (1995) based on the literature identifies four main categories of roles needed to be performed by the moderator of the computer conferencing:

- *Pedagogical or "intellectual"* (Paulsen, 1995) roles are some of the most important roles of the on-line discussion moderator/tutor. The moderator uses questions and probes for student responses that focus discussions on critical concepts, principles and skills. Pedagogical aspects involve a number of roles the tutor-facilitator has to perform such as: open the discussion, focus on content that is debatable, intervene to promote interest and productive conversation, guide and maintain involvement in discussion, and summarise (Mason, 1991b).
- *Social* roles involve the creation of a friendly, social environment in which learning is promoted. McMann (1994) considers the social role to be one of the most important roles an on-line moderator has to perform. The moderator should take into consideration a number of factors performing his/her social roles, such as: recognise the fact that there might be lurkers being afraid to participate; the use of humour must be minimised taking into consideration cultural and ethnic backgrounds; an opportunity for the participants to introduce themselves should be given; interactivity should be promoted by using different techniques; and finally the moderator coming across flaming should remind participants about netiquette.
- *Managerial or organisational* (Paulsen, 1995) or procedural or administrative roles involve setting the agenda for the conference, the objectives of the discussion, the



timetable, procedural rules and decision-making norms. Managerial recommendations include encouraging the participants to be clear, responding to the participants' contributions, being patient, following the flow of the conversation and encouraging comments, synchronising, handling overload of information, encouraging participation, and ending the sessions.

- *Technical* roles involve the facilitator in the procedure of making participants comfortable with the system and the software that the conference is using (McCreary, 1990). Technical recommendations include the provision of a study guide, directions and feedback on technical problems, provision of time to learn new software and encouragement of peer learning.

According to Rohfeld and Hiemstra (1995) it is the moderator who makes the difference between a successful and an unsuccessful conference, who takes responsibility for initiating, maintaining, re-energising the conference during periods of inactivity and impacting of the conferencing experiences. Initiating the conference involves training the learners to use new software; establishing a setting for the learners to feel comfortable; providing well-designed study guides; providing various means for eliciting conversation, thinking, reflecting, and criticising; providing a variety of learning options to stimulate participation; incorporating electronic resources; using learning contacts to guide participant planning. The moderator is also responsible for guiding and maintaining involvement in productive discussion. By maintaining the conference the moderator should: divide the material into topics for suitable discussion, summarise readings to be discussed, open the discussion with the intention to stimulate conversation, observe the discussion intervening to maintain a productive conversation, summarise and reflect on the conversation, react and remind participants about etiquette when flaming occurs. The moderator's tasks also involve the re-vitalisation of the conference going through a period of relative inactivity. Re-energising the discussion involves the use of various techniques such as: use of brainstorming activities, debates, use of synchronous communication, invitation of guest lecturers, arrangement of student-moderated discussions, use of weaving techniques like summarising, and unifying threads, and personal journal writing. Finally, the conference moderator would be responsible for obtaining feedback regarding the conference's impact on participants.

As Paulsen (1995) recommends, "moderators should identify their preferred pedagogical styles, based on their philosophical orientation, their chosen moderator roles, and their preferred facilitation techniques" (p.81). Pedagogical styles are based on several philosophical orientations and theories. In moderator roles a number of organisational, social and intellectual roles are identified. Finally, facilitation techniques involve a number of organisational, social and intellectual aspects.

Collins and Berge (1997) stress the fact that while there is a growing body of literature describing the roles of on-line instructors, there is no similar body of literature that specifically addresses the roles, tasks and functions of on-line EDG (electronic discussion groups) moderators. Collins and Berge (1997) for the purposes of their research have defined "public electronic discussion groups" as publicly accessible on-line, topic-focused discussion groups to which individuals can voluntarily subscribe or can read in Web-form. They also point their difference to the classroom where participation is involuntary, and they see similarities and differences in the power and authority exercised in classrooms and EDGs.

Collins and Berge (1997) in their study of electronic discussion group (EDG) moderators identified a number of roles, tasks, and responsibilities they should take up as their duties as seen in the next Table 2.3.

Category	Indicators
Filter (content)	To make a higher signal/noise ratio; keeps advertising out; keeps out tasteless jokes; weed out irrelevant, impolite, illegal, etc. contributions
Firefighter	Prevent flame wars; eliminate petty flames; keeps out ad hominem attacks; referees
Facilitator	keep group focused toward mission (i.e., group leader); attend to interpersonal issues between group members (e.g. complaints)
Administrator	Help with technical problems; archiver; delete/add members; "sweeps floor"
Editor	At a minimum: to enhance the clarity of the posted information, (e.g., added references: headers, inserted comments in [brackets], reformatted text, clarified citations of other articles, ask authors for clarifications and/or rewrites, sometimes suggesting same
Promoter	Generates useful discussion; finds and posts interesting posts from other sources
Expert	Expert in field/manufacturers representative; evaluates accuracy of information in posts; answers technical questions; compiles FAQ
Helper	Help people with needs (more general than "Expert")
Participant	Just like everyone else (as opposed to "Expert" or "Administrator")
Marketer	Promote/explain list to potential members

*Table 2.3- Moderator's Roles :Collins & Berge, 1997*

Collins and Berge (1997) also provide us with a number of reasons why a list should or should not be moderated. The reasons why a list should be moderated include:

- Removing irrelevant messages
- Keeping discussion focused on the topic
- Keeping down aggressive posting
- Posting announcements and material on time
- Edit posts.

The reasons why a list should not be moderated include:

- Slowing down of response time, therefore it is time consuming
- Adults feel that can be self regulated

- Resentment of moderator's censorship.

Paulsen (1995) compiled his own list of facilitation techniques that have been divided into three groups: the organisational, the social and the intellectual facilitation:

In the *organizational* facilitation the moderator should:

- "Require", "encourage", "force" and "vary" participation by asking the individual to participate more actively
- Move misplaced content and guide students going back to the original topic
- Have a student conduct the discussion, therefore students could take turns as assistant moderators
- Conclude discussions by giving them a decisive end
- Invite visiting experts
- Be patient
- Don't overload
- Use open-ended remarks, examples, and weaving
- Use private messages to motivate participants to take part in the discussions
- Use simple assignments
- Be clear
- Encourage participants to address each other
- Synchronise
- Take initiatives.

#### *Social* Facilitation

- Reinforce or request if necessary good discussant behaviours
- Follow the flow of the conversation, guiding it at the same time toward the subject
- Be responsive
- Request participants' meta-comments.

#### *Intellectual* Facilitation

- Summarise the discussion
- Write comments
- Respond to student contributions
- Make the material relevant by relating them to student experiences
- Present conflicting opinions
- Request responses
- Simulate an agent provocateur by challenging your own entries

- Be objective
- Expect less
- Summarise assigned readings on-line.

## **2.2.5 DECISION MAKING IN CMC**

### **2.2.5.1 INTRODUCTION**

According to Sproull and Kiesler (1993) the dynamics of electronic groups are different compared to the dynamics of the face-to-face meetings. Therefore, there is a need for the researchers to attempt to understand the ways people behave in the electronic meetings. Sproull and Kiesler (1993) also suspected that participation patterns and the quality of decision in computer conferencing may vary enormously compared to those in face-to-face meetings. A number of the factors influencing the on-line group decision-making procedure were identified in the literature.

### **2.2.5.2 DSS AND GDSS (GROUP DECISION SUPPORT SYSTEMS)**

DSSs or GDSS Group Decision Support Systems were developed to support decision-making procedures. Huber et al. (1993) have defined group support systems as "...computer-assisted technologies used to aid group efforts directed to identifying and addressing problems, opportunities and issues" (p.257).

DSSs incorporate "two major components, a database and a model base. The database maintains, in lieu of the decision maker, information regarding a specific decision situation, while the model base includes models, simulations, and other formal tools, which are used to structure and analyse the specifics of a given decision situation and suggest an appropriate solution" (Singh & Ginzberg, 1996: 156). DSSs make use of operational organisational data to help construct models to facilitate decision-making.

For Higgins (1991) GDSSs attempt to "integrate group sharing and communication structures with management software. In particular, GDSSs are best understood as the GroupWare version of more conventional decision support systems (DSSs)". Additionally, "there has been significant research in the use of semantic and conceptual structures in Hypertext for both individual decision support and for collaboration". There is also a "number of argumentation and discourse systems available employ shared views to allow groups to develop shared understandings through semantic hypertext representations. In addition to these systems, collaborative hypertext authoring environments allow authors to construct hypertexts for themselves or for others" (Turoff et al., 1999).

A number of studies evaluated the effects of GDSSs. For instance, Nunamaker et al. (1989) evaluated the effects of GDSS in IBM and found enhanced participation in the group. Poole et al. (1993) found group decision-making to be rather problematic in CMC. Research on

group satisfaction in connection to GDSS presented varied results. In some cases face-to-face groups reported greater satisfaction in comparison to CMC groups (McLeod, 1992; Benbasat & Lim, 1993). Other researchers found CMC groups highly satisfied (Dennis & Gallupe, 1993).

However, presenting the functions of these decision support expert systems, their advantages or possible disadvantages and research on evaluation of those systems is beyond the scopes of the present literature review.

### **2.2.5.3 FACTORS AND OUTCOMES**

There is a body of literature referring to factors affecting the decision-making procedures in CMC. However, it has to be noticed that the bulk of the literature focuses on the comparison of differences between face-to-face and computer-mediated group decision-making. On the other hand, it needs be noticed that the majority of the studies do not directly refer to educational settings. McConnell (1994) successfully remarks that up to the point his book had been published the bulk of the research on CSCL had largely focused on the technologies that support group decision-making. The research had mainly been experimental and laboratory-based. Additionally none of these studies had focused on educational settings, it rather looked at its "use for administrative and managerial purposes" (McConnell, 1994: 205). Lea and Spears (1991) also seem to suggest that early work in the field of computer support for group decision-making was mainly "descriptive and theoretical" and only recently "social psychologists have begun to investigate the psychological processes that are involved" (p.283).

#### **2.2.5.3.1 DECISION QUALITY**

Hiltz et al. (1986) have initially identified the need for the research studies to examine not only "how the medium affects (the decision-making) process, but also how these differences in process in turn affect the outcome of the group decision-making" (p.230). Therefore, they hypothesised that differences in communication process will be related to communication outcomes and that computer-mediated groups would be "relatively" effective in terms of decision quality. It was found that computer conferencing tends to "produce relatively more of the types of communication that support high-quality decisions and relatively less of the types that lead to group agreement" (p.243).

A part of the literature compares decision-making procedures in both face-to-face and on-line situations. Findings on quality of the decisions appear to be mixed. Adrianson & Hjelmquist (1991) in an experiment investigating different aspects of communication pattern and communicative outcome in face-to-face and computer-mediated interaction found no differences in decision quality depending upon medium. A number of other studies have also found the quality of decisions equally good or found no significant differences between the two modes of communication (Hiltz et al., 1986; Straus & McGrath, 1994). Hollingshead (1996a) also examined the impact of communication technology (computer based and face-to-face) on information sharing and the quality of group decisions. He was particularly concerned with the effect of rank ordering of the information processing. Therefore, a new parameter that of information processing has been introduced.

Hollingshead (1996a) hypothesised that computer-mediated groups would share less information, and that there should be information suppression (Hollingshead, 1996b) in CMC. Participants were undergraduate students in an introductory psychology course. It was found that the "rank order decision procedure improved decision quality for groups that interacted face-to-face, but not for groups that interacted via computer" (p.186). Thus, information access was found to have no impact on the quality of decision in computer-based decision-making. In general, a suppression of information sharing was found in the computer-mediated communication. This finding seems to disagree with the earlier finding by Hiltz et al. (1986) who reported that the computer based groups reached the same improvement in quality for the complex rank-ordering problem. They also commented that asking for opinions appeared to help the computer mediated groups. On the contrary, it seemed to have harmed quality of decision in face-to-face groups.

Singh and Ginzberg (1996) in a laboratory experiment testing the utility of a DSS in a sample including BBA, MBA and computer science students found a significant impact on the decision-making process and outcome due to the existence of the activity window. The activity window "contained a graphical representation of a proposed solution strategy in the form of a procedural flowchart" (p.160). They claimed that both strategy conditions, decision-making efficiency were significantly improved by the presence of the activity window.

### **2.2.5.3.2 CONSENSUS**

A number of studies compared the ability of a group to reach consensus in both face-to-face and CMC settings indicating a difficulty of the group members to reach consensus in CMC (Dubrovsky et al., 1991; Hiltz et al., 1986; Siegel et al. 1986; Weisband, 1992). Sproull and

Kiesler (1993) suggest that electronic communication in the group “reduces conformity and convergence as compared to face-to-face group discussion” and “if a decision requires consensus, an electronic group has to work harder to get it than a comparable face-to-face group does” (p. 65). Weisband (1992) in her study conducted using electronic mail found that the group would come easier to achieving consensus in face-to-face situations. However, in electronic discussions member's positions were far from the final decision.

For Turoff (1989) the decision making process within the group involves the exploration of ideas. Consensus is not necessary to be reached from the beginning of the interaction. However, since consensus is needed then it is becoming increasingly important for the group members to contribute their ideas. Research connected consensus to the time factor. CMC systems are more time consuming and make it more difficult for the group members to reach consensus in comparison to face-to-face groups (Adrianson & Hjelmquist, 1985, 1991; Dubrovsky et al., 1991; Sproull & Kiesler, 1993; Hollingshead, 1996a; Olaniran, 1994). Hiltz et al. (1986) in particular found up to three times as many communication units in the same amount of time in the face-to-face interaction in comparison to computer-mediated communication.

Sproull and Kiesler (1993) also was found that it takes approximately as long for a three-person group to make a decision electronically and ten times as long in a four-person group. Additionally, decisions made under a short deadline can be rushed and more “extreme or polarized than decisions made in electronic discussions in which groups took as much time as they needed” (p.69). However, the researchers commented that eventually the total communication time spent in both face-to-face and electronic communication was about the same because the electronic groups spent less time in meeting, on the telephone, on writing memos, etc. Additionally, the group member’s motivation and performance was found to be better in electronic groups. Therefore, the researchers conclude that there is no need for increased time of the electronic groups.

Valacich and Schwenk (1995), on the contrary, in a laboratory experiment on the effects of devil's advocacy and dialectical inquiry techniques within face-to-face and computer-mediated groups found computer-mediated groups developed and considered more solution alternatives. However, group members would require more voting rounds to reach agreement than did face-to-face groups. Computer-mediated groups were more satisfied with the process than face-to-face groups; no differences were found in satisfaction with decision outcome.

Ross (1996) considers that it is the asynchronous nature of the electronic communication that decreases the group’s ability to come to an agreement through consensus. Marjanovic (1999)



also suggests that the synchronous mode of collaboration in the group enables better handling of the decision making processes.

### **2.2.5.3.3 TASK DEPENDENCY**

Hiltz et al. (1986) associated decision-making and task type in computer-mediated decisions. They hypothesised that "communication process and outcome will be related to task type as well as to communication mode. In particular, computer conferencing will be relatively less effective for reaching agreement on the human relations task, which is more dependent upon social-emotional types of communication" (p.232). The results have supported their assumption. In particular, the ability to reach consensus was found greater concerning human relations problems.

### **2.2.5.3.4 POLARISATION**

Initially, Kiesler et al. (1984) draw attention to the group polarisation phenomenon in the on-line environment. Elements of polarisation, also known as the persuasive arguments theory were found by Kiesler et al. (1984). They found that group participants would exhibit more polarised arguments in an on-line environment basing their assumption on a number of explanations. Initially, the lack of social and communication cues, a motif frequently appearing in studies of CMC outcomes, is to be charged for the exchange of polarised arguments. Secondly, the lack of feedback in combination with frustration could be blamed for the polarisation in the group's arguments. Thirdly, de-individuation linked to "anonymity, reduced self regulation and reduced self awareness" (Kiesler et al., 1984: 1126) seems to be responsible for the expression of extreme opinions in the CMC group (Siegel et al., 1986). Additionally, depersonalisation in combination with the lack of social cues is blamed to focus the group participants' attention mainly on the content of the written messages (Kiesler et al., 1984; Siegel et al., 1986). Finally, focus on particular etiquette related with computer culture encourages expression of extreme behaviour (flaming) (Kiesler et al., 1984; Siegel et al., 1986). The role of anonymity as a factor reducing the impact of the group over its members was also investigated by Postmes and Lea (2000) as a key element to improve group's performance. They started with the assumption that anonymity in decision-making procedures would be proved beneficial in a number of indicators. However, Postmes and Lea (2000) found that the only reliable indicator was linked with more participation and that the integration of anonymity into phases of group decision support does not guarantee improved performance.

McGuire et al. (1987) seem to make a connection between equality in participation and polarisation in expression or group participants' arguments. Sproull and Kiesler (1993) also found that during the decision making procedure the group shifted towards more extreme positions than face-to-face groups usually do and had enormous difficulty reaching consensus (p.64-65).

However, Lea and Spears (1991) appeared not to be particularly convinced with the explanations of Kiesler et al. (1984) and Siegel et al. (1986) of CMC groups' "uninhibited and antinormative behaviour", commenting that there is a need for definition of normative and "antinormative" behaviour. They questioned the central argument of connection between polarisation and the lack of social cues commenting that "if people in CMC are impervious to social norms it is not entirely clear how this particular norm penetrates through the system. Meanwhile, if it penetrates successfully, why don't other more pervasive norms as well?" (p.286). In fact, they argue that the assumption that CMC is characterised by weakening of social norms seems to have little support, as "an absence of social cues from other interacting individuals, together with the resulting uncertainty, forces people to resort to default norms to guide their behaviour" (p.287). Therefore, Lea and Spears (1991), adopting the approach of *social identity theory* (Tajfel & Turner, 1986; Reicher, 1984) that conceives de-individuation and anonymity not to weaken but to actually reinforce salience ("depolarisation") in the group, tried to find the connection between the social contexts and the decision-making procedure. Evidence that polarised decision-making can be associated with the factors of anonymity and de-individuation is also found in previous studies (Hiltz et al., 1989; Spears et al., 1990). Thus, Lea and Spears (1991) conducted an experiment with first year psychology students randomly placed in groups. They also tried to make sure that group identity was made salient, group participants were placed in isolation in separate rooms, and finally they were provided with an "issues booklet". Researchers found that: a) greater group polarisation in the direction of a pre-established group norm when members of a salient group were de-individuated, b) polarisation associated with greater proportion of social remarks and with more unequal participation (p.296-297). They concluded, "social and normative context may be of even greater importance in CMC" suggesting that "earlier research underestimated the role of the contextual factors and normative processes in CMC" (p.299).

#### **2.2.5.3.5 RISK IN DECISION MAKING**

A part of the literature in on-line decision-making seems to present results where the group members would make riskier decisions in CMC in comparison to face-to-face situations (Siegel et al., 1986; Weisband, 1992). However, McGuire et al. (1987) in particular in an

experiment in Carnegie- Mellon University involving managers and university administrators, tried to examine the influence of group communication on group decisions. They based their hypotheses on the *Social Comparison* and *Persuasive Arguments* theories. The first hypothesis, involving an interpretation of the social comparison theory was expecting richness of the discussion not to affect choice shift and attitude polarisation. The second hypothesis based on the persuasive arguments theory, predicted choice shift and polarisation to be greater in face-to-face than CMC discussions. Results provided some support for both theories. More specifically, they found that groups that met face-to-face made choices that were "risk averse for gains and risk seeking for losses" (p.926). They also found that when groups met face-to-face "they exchanged more arguments and they shifted toward prospect theory predictions more than when they met via computer" (p.926). McGuire et al. (1987) believed those differences to reflect limitations of CMC discussion suggesting also the need for future research.

#### **2.2.5.3.6 STATUS**

Status is considered to be an important factor effecting decisions in the face-to-face group as high status participants in mixed status groups are considered to establish dominance and influence (Berger et al., 1977; Holtgraves, 1986; Weiner & Goodernough, 1977). In general terms, computer-mediated communication is conceived to have an equalising effect reducing social barriers among the group members (McGuire et al., 1987; Siegel et al., 1986).

Different studies have shown that higher status (for example leaders) or dominant group members are less likely to exercise dominance in the on-line discussion. Therefore, decision-making is less influenced by the participants' status (Duvrovsky et al. 1991; Hiltz et al., 1986; Sproull & Kiesler, 1993; Kiesler, 1992). Sproull and Kiesler (1993) found that: "group decisions are unpredictable, unconventional, democratic and less constrained by high status members" (p.66). Therefore, the electronic groups were found to be more democratic as high-status person's dominance declined when a decision was made electronically.

Additionally, electronic groups would consult more people resulting in an increased number of alternative opinions under consideration.

Kiesler (1992) also agrees that decision making in the computer conference is less influenced by participants' status in the group. Therefore, more democracy could improve decision-making. Kiesler (1992) tried to find alternative explanations for the openness and democracy one finds in electronic discussions. The most attractive and promising is the one that connects democracy in electronic groups with the absence of social cues. "People notice their

social surroundings less and cease to care how others evaluate them. Hence, they spend less time in social posturing and social niceties” (p.155).

Duvrovsky et al. (1991) based on the repeatedly "equalisation phenomenon" recurring across many studies of CMC, formed their research on the assumptions that CMC would assure more equal participation; the advantage high-status group members had in face-to-face discussions would be reduced; and finally participation opportunities of low-status group members would be reinforced by relevant experience. Subjects were 96 MBA students. Researchers, in order to reinforce status differences among group members and therefore validate their research, asked them to state their names, academic status, and relevant experience. Duvrovsky et al. (1991) found that the impact of status and expertise on participation and advocacy and on credibility and influence has been reduced in CMC. Additionally, increases in participation and assertiveness of low status members were found. Low-status members were more likely to be first when a discussion concerned a freshman decision.

However, Weisband et al. (1995) found that high status participants are likely to maintain their influence in both face-to-face and computer mediate decision-making procedures. Additionally, Spears and Lea (1994) hypothesised that there would be no differences in the exercise of higher status members on both face-to-face and CMC. According to them, technology is another way for higher status members to exercise their authority. Hollingshead et al. (1996b) also noticed the status effects in accepting or rejecting arguments. Therefore, they do not believe that CMC leads into equalisation structures.

Hedlund et al. (1998), attempting to explain higher status group participants' attitude towards the continuation of their status, successfully remarked that "the persistence or attenuation of status effects in CM interaction may depend on the awareness or expectations that such differences exist, rather than simply on features of the communication technology. For example, if members have some reason to believe status differences exist within the group, they may seek out cues in written communication even when no direct information is provided regarding the communicator's identity" (p.35).

#### **2.2.5.3.7 LACK OF SOCIAL AND CONTEXTUAL CUES**

According to Kiesler (1992) the lack of social and contextual cues is influencing group dynamics and furthermore the decision making procedure. In a series of experiments she compared how electronic small groups using computer conferencing would make decisions. “All the experiments showed that using a network slowed up decision making but also made

the participants talk more frankly and more equally. Instead of one or two people doing most of the talking, as happens in many groups, everyone had "a say". On the dark side, people also expressed extreme opinions and anger more openly in electronic communication than when they talked face-to-face" (p.154). Scifres et al. (1998) also connected the lack of the social cues with an increased chance of misunderstandings. They also blamed the asynchronous mode of electronic communication for the decreased ability of the group to come to consensus and agreement.

Higgins (1991) cites Dobos and Grieve (1985) who studied the decisional productivity of synchronous online conferencing by comparing the ratio of decisional output messages to messages representing social presence, task related input, and group procedural input. Higgins remarks that these results suggest that the "use of turn-taking protocols and the use of rotating moderators (with each participant "handing-off" to the next when their contribution was finished) increases decisional productivity". Also "further investigation demonstrated increased participant satisfaction when turn-taking protocols were implemented in online synchronous groups".

Yazdani and English (1999) conducted research at Exeter University in Computer Science observing co-operative learning. The sample had been using project-based team-work in order to develop personal transferable skills and increase the employability of the students. The researchers had found that discussion took place among the group members involved decision making for one of the following purposes:

- Identifying the task - trying to clarify for what was required by the task
- Managing the group & task - allocation of roles, subtasks & timing
- Doing the task - finding a solution and plan of approach.

Yazdani and English (1999) commented that the student learning was implicit during the decision-making discussions. Students made suggestions supported by explanations, and explanations were requested and given sometimes. However, that was not a common practice for the group.

Ross (1996) found prior knowledge to have a substantial impact on group decisions. He commented that "what students say is more likely to be taken seriously if it is obvious they know what they are talking about. Of there are grounds (from reading and the instructor) for judging the worth of individual contribution, students with prior knowledge will have more influence on group decisions. Students with prior knowledge are more likely to engage in high level conceptualisation tasks because they bring to the course a framework for interpreting new information" (p.39).

## **2.2.6 CONFLICTS AND DISAGREEMENTS IN CMC**

### **2.2.6.1 INTRODUCTION**

According to Johnson et al. (1991) co-operative learning is an instructional technique involving students working in teams to accomplish a common goal including the following elements:

- positive interdependence (group members rely on one another aiming to achieve a common goal),
- individual accountability (students in a group are accountable for doing their share of the work),
- face-to-face promotive interaction,
- use of collaborative skills (trust-building, leadership, decision-making, communication, and conflict management skills),
- group processing (setting of group goals, identification of changes).

Therefore, Johnson et al. (1991) recognise conflict as an important element of group working and also suggest that the conflict management skills are one of the collaborative skills required for participation in groups.

On the other hand, according to Dillenbourg and Schneider (1995) wide-area networked communication software constitutes a rich ground for controversial discussions, where someone can observe intensive debates. However, they note that those debates may not trigger appropriate mechanisms, because they are too philosophical, or there is a large turnover in the participants or simply because the setting does not force them to reach agreement. Nevertheless, Dillenbourg and Schneider (1995) indicate that those tools offer a great potential for conflictual interactions, as anonymous participation of group members and the limited text-based communication enable participants to "engage into an intellectual debate with fewer emotional consequences than in co-presence interactions".

### **2.2.6.2 FLAMING**

Research has shown that in general terms computer-mediated communication tends to promote disinhibition in comparison to face-to-face communication within groups (Kiesler et al., 1984; Hiltz et al., 1986). Additionally, computer-mediated communication can result in negative and hostile behaviour such as flaming (Sproull, & Kiesler, 1986; Lea et al., 1992;

Siegel et al., 1986), excessive swearing, insults, threats (Walther et al., 1994; Rice and Love, 1987), uninhibited verbal behavior (Collins, 1992) sometimes even the so-called virtual "rapes" (McKinnon, 1997).

The most common expression of conflicts in the on-line environment is the phenomenon of flaming. It seems that definitions of flaming vary according to the writers, however, it generally means the use of negative, inappropriately hostile, and insulting language (Walther, 1992). Flaming has also been characterised by Sproull and Kiesler (1993) as a "rude" and "impulsive" behaviour and it is considered to be more common on-line than in other forums. Matheson and Zanna (1990) define flaming as the use of "offensive language and being interpersonally insulting" (p.1). For Wang (1996) flaming takes the form of "personal attack", "taunting", or "didactic" behaviour.

### **2.2.6.3 REASONS FOR FLAMING**

Kiesler et al. (1984) tried to explain that inhibited verbal behaviour found in their research based on the following reasoning: 1) difficulties of co-ordination caused by the lack of feedback, 2) absence of social cues and c) depersonalization. Wang (1996) lists a number of reasons why people use flaming in the on-line environments including: violation of the rules of the customs of the Internet culture and "ethnocentrism" when people fail to understand and appreciate other's different cultural norms. A number of reasons have been identified by the literature as common causes of flaming in CMC environments, mainly including the lack of social/communication cues, misinterpretation caused by the lack of social cues and anonymity.

#### **2.2.6.3.1 LACK OF SOCIAL/COMMUNICATION CUES**

Electronic dialogue is considered good for information exchange, opinion and suggestions but is less suited for communicating agreement and disagreement and less effective for social-emotional tasks involving conflict and negotiation (Hiltz & Wellman, 1997).

Over the past decade, literature supported consistently the hypothesis of the connection between the absence of social and communication cues with the expression of uninhibited verbal behavior in computer-mediated communication (Collins, 1992).

According to Collins (1992) face-to-face communication is the richest in social cues and any form of computer-mediated communication diminishes the cues available. Schaefer (1997) in an attempt to explain the reasons why on-line communication encourages misinterpretation

and eventually miscommunication places the importance on the provision of adequate context. He believes that "current on-line communities have no built-in mechanisms for assisting users in negotiating a common frame of reference. Therefore, a common context must first be made explicit before further dialogue can ensue in...unless users volunteer contextual information within their posts, others are forced to attribute intention and meaning without the benefit of a shared context". Brouwer (1997) also seems to support the argument that on-line postings, deprived from context and any additional information, are subject to ambiguity and misinterpretation.

Berge (1997) blames the lack of communication and social cues in computer-based conferencing for the occurrence of misunderstandings and misinterpretations, because they set the stage for more uninhibited behaviour compared to face-to-face situations.

The meaning of an utterance in face-to-face communication can be conveyed by use of visual and infective cues, such as face expression and intonation. Most CMC systems do not enable these multi-modal forms of communication and hence there is an increased risk of misinterpretation (Moore, 1993).

#### **2.2.6.3.2 MISINTERPRETATION**

It has been argued that the limited social presence of computer-mediated communication encourages misinterpretation of remarks. Wang (1996) considers misunderstanding as the main reason why people flame on-line. "Misunderstanding occurs for two reasons: the sender of a message fails to make clear what is intended; or the reader reads too much into what is not there. When a message equivocates, it forces the reader to read between the lines and make assumptions about the intended meaning based on the readers' own value systems and moral judgement. Once a message is misunderstood, the reader takes offence where no offence was intended".

Shapiro and Anderson (1985) in a report about the use of e-mail charge misinterpretation of the message content as the main cause for the "flaming" phenomenon. However, he lists a number of other possible causes:

- Due to the difficulty to distinguish the level of formality of a message from its appearance as the cues are more subtle than telling the difference between a scrawled note and a formal memorandum



- Because of the lack of cues to the level of formality, the nature of writing, and because most participants are not professional writers, attempts at humour, irony, sarcasm, and wit are often misinterpreted
- Immediate feedback from body language, interruptions, or other cues we have developed as a society to aid the communication process is lacking in this medium.

According to Ross (1996) the lack of the social context in the electronic group increases the chances of misunderstandings in the group.

Another source of misunderstandings in the electronic group would be the overestimation of the member's input in the group and conversely the underestimation of the other group members' contribution (Kiesler, 1992).

### **2.2.6.3.3 ANONYMITY**

Although, anonymity in general is considered an advantage in on-line group communication, especially in connection to participation, it may also become a source of problems. "Having the opportunity to express anything at all anonymously may result in student misuse" (Marjanovic, 1999: p.137).

Sproull and Kiesler (1993) found flaming being enhanced by anonymity that leads to "deindividuation" as "deindividuation occurs when people have anonymity or when situations lack reminders of societal mores and values" (p.50). Flaming, presented as "rude" and "impulsive" behaviour, being reinforced and strengthened by anonymity, argumentation and freedom of speak that can lead into increased, deeper group conflicts (Sproull & Kiesler, 1993).

Siegel et al. (1986) also charged anonymity and lack of social feedback for loss of identity and uninhibited behaviour that might probably lead into deindividuation. The issue of deindividuation has also been discussed by Matheson and Zanna (1990) who stated that it led to a loss of awareness of social behaviour.

### **2.2.6.4 RESEARCH ON FLAMING AND CONFLICTS IN CMC**

Kiesler et al. (1984) in their research examining the effects of social and psychological aspects in computer-mediated communication found that "people in CMC groups were more inhibited than they were in face-to-face groups, as measured by inhibited verbal behaviour,

defined as frequency of remarks containing swearing, insults, name calling and hostile comments" (p.1129).

Sproull and Kiesler (1986) in their study of organisational communication via e-mail found people being less careful when using e-mail in comparison to face-to-face communication. In general, they found negative behaviour-characterised as flaming- as "reduced social context cues, provided information that was relatively self-absorbed, undifferentiated by status, uninhibited, and provided new information" (p.1509).

Smolensky et al. (1990) studied the influence of task type and group structure on uninhibited expression in computer-mediated communication. They connected flaming with group composition as they dictated that uninhibited behaviour was higher among members who knew each other before the study. They also found that more dominant participants were more likely to demonstrate uninhibited behaviour. Finally, higher levels of uninhibited behaviour were connected to lower levels of productivity.

McCormick and McCormick (1992) in their research of the use of e-mail in university undergraduate settings found little signs of flaming and uninhibited behaviour. In an attempt to interpret and explain their findings, they remarked that the e-mail users had already established relationships before starting using the on-line facilities.

Orlikowski and Yates (1993) investigated the linguistic and textual patterns of electronic communication in an ongoing group of participants collaborating on a specific task. They found that while "23.8% of the messages were coded as emphatic, most of them were simply strong statements of agreement or disagreement with the substance of another participant's position or argument rather than the emotional outbursts, name-calling, exaggerated emphasis, inappropriate innuendoes or sarcasm, and obscene language of flaming". Therefore, they noted that flaming was limited by the familiarity of the group members and the task demands.

Brown (1995) at the Temple University found that groups shared general information more freely among each other, although she commented that they avoided sharing information of personal nature, and they found it more difficult to resolve conflicts.

Ross (1996), studying the influence of computer skills in participation, coded the data using four category schemes. His set of categories was based on Woodruff's view of small groups that used argument as a form of "inquiry, developing shared knowledge through constrictive conflict" (Ross, 1996). Woodruff's argumentation hierarchy was used in the study and it involved four levels of argumentation:

- Level 1: arguments consisted of building a set of collectively valid statements,

- Level 2: arguments are the elaboration of an idea by suggesting warrants, evidence, or ways to test the idea,
- Level 3: arguments note discrepancies between a proposed idea and conventional belief,
- Level 4: an idea is challenged by pressing contrary evidence, thereby suggesting an alternative hypothesis (Woodruff, 1995 as cited in Ross, 1996).

Ross (1996) based on the above hierarchy found that more knowledgeable students with prior experience of the topic were more likely to engage in all types of argumentation. The differences were especially noticeable in the upper level argument category and almost all the examples of arguments identified in Level 3 or Level 4 came from those with prior knowledge of the topic under investigation. Ross (1996) is clearly making a comment on the engagement of group members with prior knowledge on conflicts. It is quite interesting also to notice that conflicts were used with the meaning of arguments on a subject. However, arguments are not always having that negative meaning conflicts do.

Sudweeks and Allbritton (1996) have explored the patterns of collaborative communication and the various stages of an on-line group development. Their sample was a large group of international researchers whose goal was to examine the characteristics of CMC. Sudweeks and Allbritton (1996) argue that although in general terms the groups characterised as democratic with well-established lines of communication, in their case tensions in the group were created by conflicting task-oriented and socio-emotional needs. Therefore, they remark that “when action is high and the group is focused on tasks, there tends to be security in the structure of working relationships; when the organisational work-oriented structure is less clearly defined and deadlines are not imposed or not urgent, the desire for intimacy and social interaction surfaces” (Sudweeks & Allbritton, 1996: 712). In result, the above researchers stressed the need to take into account the interplay of tasks and socio-emotional processes and to manipulate communication types in order to avoid stress, conflicts and improve satisfaction and productivity in groups.

Mabry (1997) studied of the relation of emotional tenor to the use of “framing strategies” (i.e. making pointed references to prior messages and quoting from those messages). He found that the use of messages framing devices and emotional involvement were systematically related.

McDonald and Gibson (1998) in a study describing the patterns of interpersonal interactions relating to group development in asynchronous computer conferencing used Lundgren’s typology of interpersonal needs. Lyndgren’s model included the following elements: Involvement, Control, Openness, Solidarity and Conflict (Lyndgren, 1977 as cited in

McDonald and Gibson, 1998) and was used as basis for devising the coding scheme during the research. However, it is quite interesting to notice that no Conflict instances were found.

English and Yazdani (1999) in research observing collaborative learning, using project-based team-work found that in one of the teams there was a strong personality conflict which affected the whole team and was never resolved. English and Yazdani (1999) commenting on the incident, pointed out that it demonstrated the need for some training and experience in the development of collaborative learning skills.

### **2.2.6.5 SOME SOLUTIONS**

Wang (1996) made a quite interesting comment about flaming. According to him, since one of the main sources of flaming is misunderstanding, senders in order to avoid flaming ought to attempt to avoid ambiguity and vagueness. Therefore, flaming in a way could encourage clearer writing and straightforwardness.

According to Collins (1992) "with most recent communications, all dynamic cues are stripped, as well as static cues, barring the feel and appearance of the writing materials. And yet norms remain attached to written communications, and their mystique and relative permanence can restrain grossly uninhibited verbal behavior, with the thought that someone else might read or save correspondence".

Kollock and Smith (1996) described and discussed major social dilemmas the members of Usenet groups have to face. They identified inevitable conflicts as they remarked that many newsgroups still remain "uncooperative places, filled with noise and argument".

Additionally, the existence of thousands of newsgroups makes it easy for individuals to share knowledge and interests but at the same time, it also makes it easy for the ones who want to disrupt to find those newsgroups and create problems. Consequently, Kollock and Smith (1996) stressed the need for resolving those conflicts as "monitoring the behaviour of others becomes easier while sanctioning undesirable behaviour becomes more difficult".

Eventually, in order to identify if, and in which ways, computer-mediated communication changed co-operation, they proposed as a solution the engagement of the research into ethnographic exploration of newsgroups by interviewing participants with the intention to uncover norms and "expectations concerning acceptable use and appropriate behaviour".

# **CHAPTER 3:**

# **METHODOLOGY**

## **3. METHODOLOGY**

### **3.1 INTRODUCTION**

This chapter aims to address philosophical issues of qualitative research in the social sciences. The section also aims to introduce the reader to the different kinds of methods of data collection and analysis utilised throughout the course of the present study. Interviews were the main tool of data collection and the grounded theory approach, as developed by Strauss and Corbin in 1990, was adopted for the analysis of the interview data. The analysis was also facilitated by the use of the Atlas.ti software for analysis of qualitative data.

### **3.2 PHILOSOPHICAL PERSPECTIVES**

According to Hughes and Sharrock (1997) the relationship between philosophy and what we now refer to as the social sciences involves historical and conceptual dimensions, as "philosophical issues remain of continuing concern in the social and the human sciences" (p.1). The initiation of thinking and writing about the philosophy of science can be traced back to the ancient Greeks. Aristotle (384-322 BC) provided an inductive-deductive view of how we obtained systematic knowledge. He maintained that the scientist should induce explanatory principles from the phenomena to be explained, and then deduce statements about the phenomena from premises that include these principles. Other Greek philosophers provided a foundation for hypothesis testing and experimentation. Euclid (300 BC) and Archimedes (287-212 BC) developed the idea of axioms, or hypotheses in mathematics and geometry.

Bacon (1214-1292) took Aristotle's inductive-deductive pattern a step further. He argued that the factual base available for induction to operate on could be augmented by active experimentation of the world (Smith, 2000). He insisted that the first requirement of scientific method is that the philosopher should purge himself of prejudices and predispositions in order to become again as a child before nature (Losee, 1993). In the seventeenth century, Descartes (1596-1650) elaborated the hypothetico-deductive method of Euclid and Archimedes and laid the groundwork for its application in science. However, it was not until the twentieth century that full appreciation of the role of experimentation in testing hypotheses, became central to the understanding of science (Smith, 2000).

According to Wisdom (1987), the social sciences consist of more than the practice of constructing and testing theories. They include the practices of collecting data, sorting the data into categories or kinds, and offering explanations of individual or group behaviour.

Philosophical assumptions about human nature and how society is conceptualised are directly related to issues about social research, including the nature and status of data that is collected and the validity of the methods by which data is analysed, interpreted and understood (Burton, 2000). Hughes and Sharrock (1997) also suggest “whether they may be treated as such or not, research instruments and methods cannot be divorced from theory; as research tools they operate only within a given set of assumptions about the nature of society, the nature of human beings, the relationship between the two and how they may be known” (p.11).

Saunders et. al (2000) argue that the way we think about the development of knowledge affects the way we go about doing research. They further stress that the important question, at the initial stage of the research, concerns the design of the research project. This is whether the research should use the deductive approach, where the research develops the theory and hypotheses and design a research strategy to test the hypotheses, or the inductive approach, where the researcher initially collects the data and then develops theory as a result of the data analysis. Finally, Saunders et al. believe that although these approaches correspond to different research philosophies- the deductive approach owes more to positivism and the inductive approach to phenomenology- their labelling is potentially misleading and of no practical value.

In designing a research study, a number of issues need to be taken into consideration. Burrell and Morgan (1979) and Guba and Lincoln (1989) seem to agree that questioning ontological and epistemological issues should be the initial steps affecting the decision on a possible methodology and a valid research framework. The word *ontology* derives from the Greek words *on* meaning "being" and "existence" and the word *λογος* that translates as "word". Ontology refers to how we make sense of and understand the nature of the world and reality. The fundamental question here regards whether reality is observable and truth can be objective and additionally, whether reality can be revealed by the scientific method. According to Rosenberg (1997) "ontology is the study of what exists, with special attention paid to the different ways of existing possessed by different kinds of things. One obvious way of going about doing ontology is science. Scientists gain information about what exists by interacting with and observing different features of the world, and searching for the best explanations of the information they gain that way".

The word *epistemology* derives from the Greek word *επιστημη* that means "knowledge" and the word *λογος* that translates as "word". Following an exact translation it is possible to say that it is the science dealing with the theories of knowledge. Epistemology is concerned with philosophical claims about the way in which the world is known to us or can be made known to us and, as such, clearly involves issues about the nature of knowledge itself. In other words, epistemology deals with assumptions about truth and non-truth. Burrell and Morgan (1979) suggest that knowledge can be either objective knowable or only subjective.

Guba and Lincoln (1994) summarised the inquiry paradigms adding a third one and basing them on three fundamental questions:

- The *Ontological* Question. What is the form and nature of reality and therefore what is there that can be known about it?
- The *Epistemological* Question. What is the nature of the relationship between the knower or would be-knower and what can be known?
- The *Methodological* Question. How can the inquirer go about finding out whatever he or she believes can be known. The methodological level is the choice of methods based on the first two ontological and epistemological questions (Guba & Lincoln, 1994: 108).

Guba and Lincoln (1994) suggest and analyse four paradigms in qualitative inquiry namely: positivism, postpositivism, critical theory and constructivism. They showed a personal preference to constructivism which was called previously "naturalistic inquiry" (Lincoln & Guba, 1985). Orlikowski and Baroudi (1991) followed Chua's (1986) categorisation which classifies qualitative research as positivist, interpretive and critical, as shown in Figure 3.1.

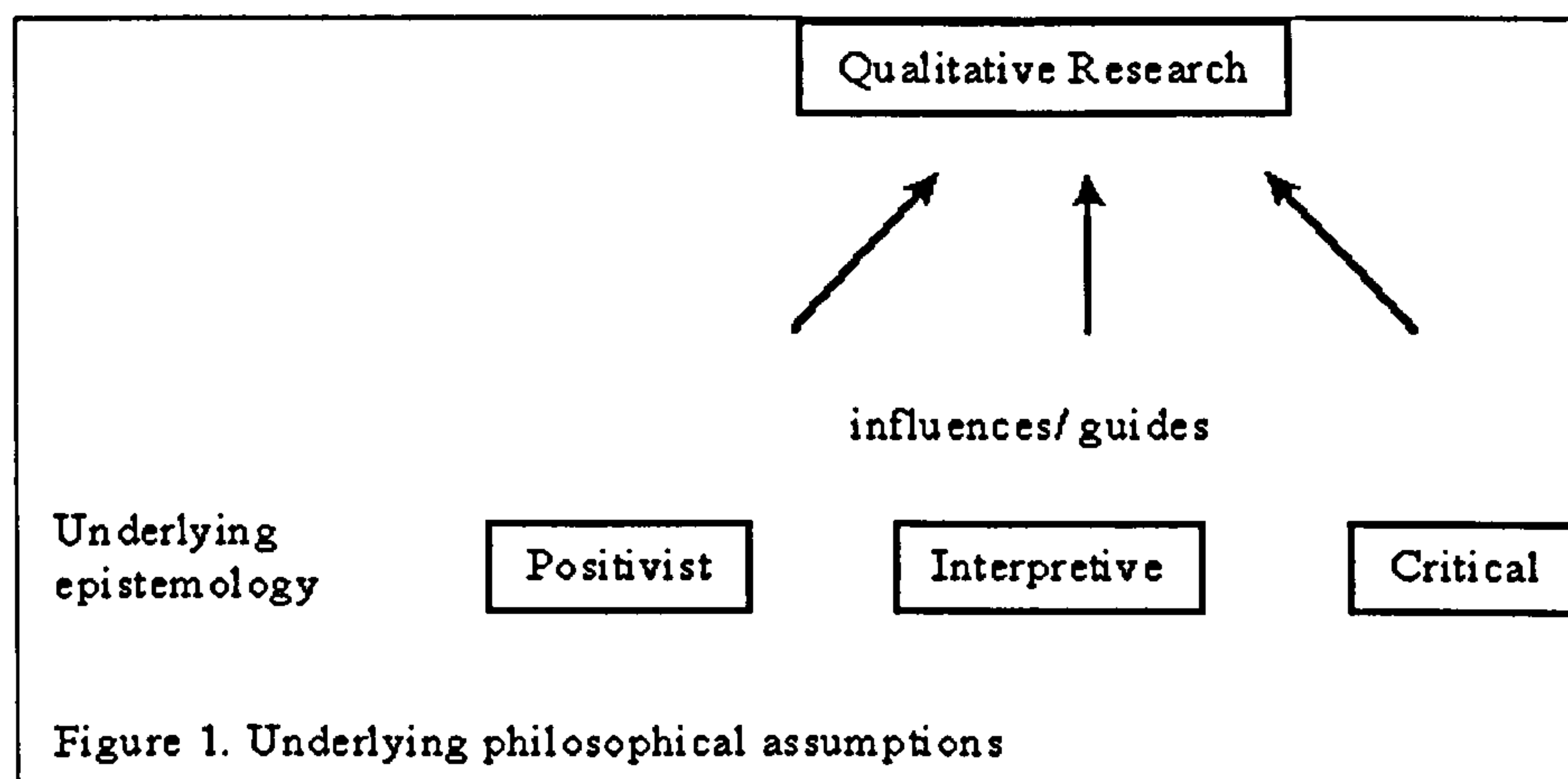


Figure 1. Underlying philosophical assumptions

Figure 3.1- Underlying Philosophical Assumptions: Myers, 1997



## *Positivist Research*

In general terms, positivists assume that the world can be described by measurable properties that can produce statistical measures and that they are independent of the researcher. Positivist studies generally aim to test theory, in an attempt to increase the predictive understanding of phenomena (Myers, 1997). The researcher who follows the principles of positivism, assumes the role of an objective analyst, making detached interpretations about those data that have been collected in an apparently value-free manner (Hollis, 1994). According to Gill and Johnson (1997) there will be an emphasis on a highly structured methodology to facilitate replication, and quantifiable observations that lend themselves to statistical analysis. The assumption is that "the researcher is independent of and neither affects nor is affected by the subject of the research" (Remenyi et al., 1998: 33). The positivistic epistemology seeks to "explain and predict what happens in the social world by searching for regularities and causal relationships between its constituent elements" (Burrell and Morgan, 1979: 5).

## *Interpretive Research*

The interpretive research approach is based on the assumption that the world and reality are subjective. Therefore, interpretive studies generally attempt to understand phenomena through the meanings that people assign to them (Myers, 1997; Klein & Myers, 1999; Orlikowski & Baroudi, 1991). In other words, the interpretivist approach attempts to understand the world from the actors' point of view.

## *Critical Research*

Critical researchers assume that social reality is "historically constituted" and that it is produced and reproduced by people. Critical research is a "social critique" focusing on the "oppositions", "conflicts" and "contradictions" in contemporary society (Myers, 1997). Research can be classified as critical if the main task is seen as being one of social critique. Critical researchers assume that people consciously act to change their social and economic status quo, acknowledging also that the human ability to improve their conditions is constrained by various forms of social, cultural and political domination along with natural laws and resource limitations (Klein & Myers, 1999).

Ontological and epistemological values along with positivist, interpretive or critical approaches present the researcher with a choice. Qualitative research is a “multi-method in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret phenomena in terms of the meanings people bring to them” (Denzin & Lincoln, 1998: 3). Qualitative methods aim to understand humans by taking their own perspective in understanding and giving meaning to the world.

Before the researcher decides what kind of research techniques he/she is going to use, it is essential to decide on the research strategy. The choice is between quantitative or qualitative strategy. One aspect of the contrast between quantitative and qualitative concerns the mode of the data analysis used. The quantitative approach considers data as a subject for statistical manipulation. Data collected from qualitative methods requires a different mode of exposition. The process of qualitative data collection and analysis takes many forms, but it is fundamentally a non-mathematical, analytical procedure that involves examining the meaning of people’s perceptions and actions.

There is a tendency to believe that quantitative social research techniques, because they are more “objective” and more mathematical, are somehow more scientific. That is arguable. It may be the case that, since quantitative approaches have more built-in correct procedures and safeguards, their use tends to be more “scientific” than the use of qualitative techniques, which are, in a sense, harder to use (Stone & Harris, 1984).

Many have questioned whether the contrast between qualitative and quantitative research is a particularly constructive one, arguing that the best research in social sciences contains elements of both. Nevertheless, of all the methodological distinctions that have been claimed, it is the quantitative/qualitative one which has proved most durable and which most accurately reflects the customary division of practice in the social sciences (Allan & Skinner, 1991).

However, in this specific case it was decided that the employment of qualitative modes of research would prove more suitable and appropriate to the topic under investigation. Following Myers's (1997) categorisation and typology on qualitative research it could be argued that the present study attempts to view the world from an interpretivist point of view, students’ views, perspectives and attitudes are engaged with in an attempt to understand what happened when students interacted with each other using various types of computer conferencing systems instead of face-to-face interaction. The study also relied on the analytic inductive method, attempting to obtain in detail what happened during the on-line group

interaction in computer conferencing. The reasons that led to such a decision are the following:

- The present study is based in a relatively recent area of research. No specific theory exists on on-line group dynamics.
- The Grounded Theory approach is often used in cases such as innovative projects which seek to find answers in areas which have not been hitherto fully investigated.
- The intention of the current research is not to "prove" any hypothesis or specific theory. Rather the aim is to present the thoughts and opinions of people who have worked as members of on-line groups and gained knowledge through their experience.

As Strauss and Corbin (1990) point out "qualitative methods can be used to uncover and understand what lies behind any phenomenon about which little is yet known" (p.19). On the other hand, Glaser and Strauss (1967) maintain that "each form of data is useful for both verification and generation of theory, whatever the primacy of emphasis. Primacy depends only on the circumstances of research, on the interest and training of the researcher and on the kinds of material he needs for his theory" (p.18).

The findings will help to build elements of a theory. In the future, when a more concrete theory has been formulated, it may be possible to test the findings quantitatively through the use of other research methods expanding it also into other disciplines, with the aim of proving its validity. In other words, in order to formulate a valid theory concerning this topic area, further research will have to be carried out. However, such future directions lie outside the scope of the present study.

### **3.3 SAMPLING**

The decision regarding the sample to be used in any research is an important one. The sample can be compared to a foundation on which the research is going to be constructed. In other words, the choice of sample will lead the research on a specific route and it will provide more validity and increased quality. Patton (1990) provides guidelines for sampling suggesting that in qualitative research "the aim of the appropriate sampling lies in selecting information-rich cases for study in depth. Information rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research" (p.169).

The concept of theoretical sampling - a term more or less "synonymous" with the term "purposeful sampling" (Lincoln & Guba, 1985:201)- arose during the first publication on grounded theory when Glaser and Strauss (1967) suggested that:

"theoretical sampling is the process of data collection for generating theory whereby the analyst jointly collects, codes, and analyses his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges. This process of data collection is controlled by the emerging theory, whether substantive or formal" (p.45).

Theoretical sampling begins during the data collection phase and involves the searching of the transcripts for emerging categories. As themes arise from the data theoretical sampling can be repeated to increase the depth of the focus. "Theoretical sampling is ... used as a way of checking on the emerging conceptual framework rather than being used for the verification of preconceived hypotheses" (Glaser, 1978: 39). According to Glaser (1978) theoretical sampling is "the where next in collecting data, the for what according to the codes, and the why from the analysis in memos" (p. 157). Theoretical sampling was always a matter, which confused people doing or reading grounded theory (Strauss and Corbin, 1990). As explained by the authors (Strauss and Corbin, 1990) theoretical sampling aims to sample events and incidents rather than persons per se. It is a cumulative process focusing initially in category generation and concentrating later on saturation of categories. Theoretical sampling allows also "the flexibility to the researcher to move around and pursue areas of investigation that might not have been foreseen or planned" (Strauss and Corbin, 1990: 178).

Students from two different courses in the University of Sheffield were chosen to be interviewed after gaining permission from their course leaders. The courses were the following:

*The University of Sheffield-Department of Information Studies-* "Elements of Information Management. Effective Communication in the Networked Organisation".

*The University of Sheffield-Department of Information Studies-* "Information Systems and the Information Society".

The courses were aiming to explore information management concepts and issues, help students to familiarise themselves with new technologies and develop information management skills. They were also based on the principles of active and collaborative learning, with group project-work as a central activity.

Subjects, chosen to be interviewed, were both males and females. We tried to assure equal numbers of interviewees in connection to their gender. The age of the interview participants ranged from 18 to 40 years. However, the majority of the interviewees were undergraduates

aged 18-22. Among the subjects that were chosen, two different categories can be identified namely: undergraduate students from all three levels of studies (first, second and third year) and postgraduate students. I tried to also have equal numbers of interviewees of all levels of undergraduate studies and postgraduates. All the students were coming from the faculty of Social sciences and were taking courses in the University of Sheffield in both the Departments of Information Studies and the Management School. The above categories assured a good range of opinions on the topic under investigation.

Interviewees were selected because they offered the following characteristics:

- They had used various types of computer-supported collaborative learning technologies (both synchronous and asynchronous) as a mode of communication in order to collaborate with their peers and tutors
- They had gained experience of learning through on-line group projects.

During the course of the current research, sampling was directed by the logic and the aim of the three basic types of coding. In the open coding sampling categories along with their properties and dimensions were uncovered. As soon as the new concepts emerged new questions were added to the original list of questions, and the interview schedule was adjusted regaining new focus. As suggested by Strauss and Corbin (1990) open sampling can be done either purposefully, where the researcher looks for data bearing the categories to arise or systematically where the researcher proceeds from one person to another looking for evidence of incidents denoting each category. The current research followed the data purposefully attempting to develop categories.

The purpose of the axial coding sampling is to relate categories and subcategories uncovered during open sampling. During the axial coding sampling I tried to propose relationships among the subcategories of each category and moreover to further develop existing codes focusing specifically on the existence of intervening conditions, the action strategies produced and the consequences that would result.

Finally, at the sampling of the selective coding I tried to link the categories at a dimensional level with the purpose of forming a theory, or at least of suggesting some possible elements of an emerging theory. During that process I tried to maximise the opportunities for verifying the already existing story line by choosing to interview some of the previously interviewed research participants. The reason for doing so can be explained by the expectations that these participants would be able to provide me with quality data on my questions as they had in the past during the data collection period. When no new information was collected sampling was considered redundant.

## **3.4 METHODS**

### **3.4.1 DATA COLLECTION**

#### **3.4.1.1 INTERVIEWS**

Interviews are one of the most common methods of data collection in the social sciences. The interview is the verbal interaction between the researcher and the respondent and can be either carried out face-to-face or by telephone. There is a considerable debate regarding the advantages and disadvantages of the interviews. The overall advantage of interview as a research strategy are summarised by Chen and Herman (1982) who argue that they allow a high response rate, direct interaction between interviewee and interviewer, immediate clarification of the questions asked, and the elaboration of data.

Additionally, interviews a) allow the researcher and the respondent to shift back and forth in time as he or she probes and asks questions appropriate to the respondent's knowledge; b) help the researcher to understand and put into a larger context the interpersonal, social and cultural aspects of an environment; c) they are very useful in discovering what people think and how one person's perceptions compare with another's, and in putting those varying responses in the context of common group beliefs and themes.

According to Gorman and Clayton (1997) interviews also have two major advantages when used in qualitative settings. The interview assists the researcher in identifying contexts and making relationships in the data. Additionally, they increase interaction between the researcher and the interviewee, at the same time allowing to the researcher to ask additional questions highlighting new areas of possible interest. However, interviews have been criticised for being especially open to bias because the personality and appearance of the interviewer can affect the interviewing process.

Patton (1980) stated that: "we interview people to find out from them those things we cannot directly observe...We cannot observe feelings, thoughts, and intentions. We cannot observe behaviours that took place at some previous point in time. We cannot observe situations that preclude the presence of an observer. We cannot observe how people have organised the world and the meanings they attach to what goes on in the world. We have to ask people questions about those things. The purpose of interviewing, then, is to allow us to enter into the other person's perspective" (p.196). Based on the above, interviews were considered to be the most appropriate method of data collection as our intention was to have no preconceived hypothesis about the topic under investigation.

Interviews may take a wide variety of forms. However, there are three main types: structured, semi-structured and unstructured (Gorman & Clayton, 1997; Rubin & Rubin, 1995). For the

needs of the present research it was decided that the semi-structured form of interviews was going to be used. The reasons that forced such a decision on the specific form of interviews dealt with the fact that these kind of interviews are conducted by having a checklist of questions and topics that are likely to be covered. However, the researcher has the freedom to ask the questions in any way and in any order he/she wants.

Additionally, it was felt that this kind of interview best suited the research we wanted to conduct, as semi-structured interviews tend to give more flexibility to the research. On the other hand, as the main aim of the study is the development of features of a model of on-line group interaction, it is inadvisable to conduct interviews with a preconceived notion of what people feel and think about on-line group interaction. On the contrary, we decided that we wanted to leave the interviewees to lead our conversation. This is, after all, the main reason why somebody is conducting a qualitative and not quantitative research. This type of interview also seemed to be closer to the grounded theory approach. The researcher who applies grounded theory does not know what to expect from the data, which arises. Therefore, only some general assumptions can be made. The theory then develops based on people's perceptions and interpretations.

However, having a set of questions to ask during the interviews left the interviewees the liberty to lead the conversation with the questions, which arose naturally from the context. In short, as it was decided that this kind of interview best suited the Grounded Theory approach, data collection was based on rearranging the questions and introducing new ones as new themes and issues arose from the data. As has been stressed by Stern (1980) the novelty of Grounded Theory lies not in the mode of investigation associated with it, but in the manner in which the information is collected and analysed. The Grounded Theory method is different from other methods as the data collection and analysis can happen simultaneously. As Corbin and Strauss (1990) have stated, data collection and analysis are interrelated processes and analysis in grounded theory begins with the data collection. Therefore, the carrying out of procedures of data collection and analysis simultaneously enables the researcher to capture all potentially relevant aspects of the topic as soon as they are perceived.

In the Grounded Theory approach the analysis starts with the very first interview. As soon as the first interview had been done, new questions are formulated in the search for new answers. The present research worked on that basis, as the interviews were not completed all at once. The interviews actually took place during the course of fourteenth months. In fact, there were three stages of data gathering. Twenty interviews were conducted at the initial stage, then there were another twenty and then ten interviews at the final stage. During those three stages answers to all the new questions that arose from the data were being sought.

### **3.4.1.2 INTERVIEW DESIGN AND PILOT RESEARCH**

The interview schedule was initially conducted with a number of questions in mind. As soon as the first five interviews had taken place they were analysed for some preliminary results that would form the next interview schedule. Indeed, a number of categories emerged from the interviews along with new questions that we wanted to ask the interviewees. Based on the codes emerging the necessary adaptations to the topic were made, refocusing with the help of the findings.

### **3.4.1.3 CONDUCTING THE INTERVIEW/ RECORDING/TRANSCRIBING**

50 semi-structured interviews were conducted in total during the current study. The main focus of the conversations during the interviews was to elicit student's perceptions and views of the factors influencing the on-line group interaction. The interviews took place in three different stages. After the pilot research that included the first five interviews, we focused more on the topic by following the data that had been given by the interviewees. As the analysis went on and more categories and their properties emerged, the topic became more focused. Unless the interviewees wanted to be interviewed in a place of their own preference the majority of the interviews took place in the Department of Information Studies in the Meeting Room that had been booked in advance. There were a few cases where the booking of the room was not possible due to booking arrangements made by other students. In those cases alternative rooms were used in other University Departments.

According to Rubin & Rubin (1995) there are a number of ethical obligations the researcher needs to take into account before conducting an interview, such as asking for permission to record, being honest about the intended use of the research, and letting people know that their participation is voluntary. We observed all these ethical obligations. Permission to record the interviews was taken before starting the interview. All interviews were conducted in English.

Different ways of making the interviewees feel comfortable and "open up" during the interview session were tried. The interview did not start immediately, instead we offered the interviewees tea or coffee along with muffins at our own expense.

However, the interview was not always an easy task. Some of the interviewees were quite shy, therefore it proved quite difficult to make them share their thoughts on the topic. It has to be also noticed that the interview schedule was not followed all the time, not all the questions were asked in the same order. Wishing to follow the interviewees' flow of thought the order of the questions had to be re-arranged or rephrased again and again in order to make



clear what it was being asked. In general terms, most of the interviewees supplied us with interesting views on the topic under investigation and were willing to help and collaborate.

All the interviews were recorded on tape and transcribed with the aim of maintaining closeness to the data in doing so. Each interview lasted approximately an hour. The shortest interview lasted 40 minutes and the longest more than 2 hours. The importance of having a high-quality recording machine should be stressed. This factor is very important and highly appreciated when the researcher moves to the next step after tape recording, which is the transcribing of the interviews. Initially, a medium quality tape recorder was used. However, when it was realised that this would add up hours and hours of extra work in transcribing, an expensive high quality recorder was bought which proved a worthwhile investment.

Transcribing the interviews was the next step and proved to be a time-consuming procedure. A transcribing machine borrowed from the Department of Information Studies was used to assist this task, as it had the extra advantage of foot controlled pedals. The transcription of the very first interview took more than 3 days, after which the transcribing speed improved. Difficulties arose from the fact that English is not the mother tongue of the researcher. Therefore, there was the danger that words or phrases would be missed out. In order to avoid something like that happening, a lot of time was spent rewinding the tape and paying attention to difficult words especially when interviewees had “strange” accents. In the cases where there were major difficulties in understanding help of native speakers was sought. The speed in transcribing improved over time up to the point that it took around 10 hours to transcribe one hour tape (For the interview schedule see, Appendix 1).

## 3.4.2 DATA ANALYSIS

### 3.4.2.1 GROUNDED THEORY

A qualitative mode of data explanation was utilised for the interpretation of the research data. This style was the Grounded Theory approach as formulated by Strauss and Corbin in 1990 in their book *"Basics of Qualitative Research: Grounded Theory Procedures and Techniques"*. The same authors also published a second edition of the book in 1998, an updated and enhanced version of the previous publication containing lots of examples of research using the Grounded Theory approach. This book was utilised in gaining more understanding of the Grounded theory techniques. In all cases we took into account other books published on Grounded Theory such as the very first publication of 1967 by Glaser and Strauss under the name *"The Discovery of Grounded Theory: Strategies for Qualitative Research"*.

This approach to data interpretation seemed particularly attractive and suitable for analysis, as it tied in with the topic's commitment to develop elements of a theory about on-line group interaction. As the approach that was taken was rather exploratory in nature, Grounded Theory as a method of developing a theory that must be grounded in the data, and must emerge from it, seemed appropriate. Its main purpose is to build a theory that is "faithful to and illuminates the area under study" (Strauss & Corbin, 1990: 24). Using Grounded Theory one does not start with a foregone conclusion and theory and then tries to prove it. With Grounded Theory the researcher "begins with an area of study and what is relevant to that area is allowed to emerge" (Strauss & Corbin, 1990: 23). These are the main reasons why the Grounded Theory approach was chosen in order to analyse the data deriving from the interviews. To the question "why build theory that is grounded" Strauss and Corbin (1990) answered:

"A well-constructed Grounded Theory will meet four central criteria for judging the applicability of theory to a phenomenon: fit, understanding, generality and control. If theory is faithful to everyday reality of the substantive area and carefully induced from diverse data, then it should fit that substantive area. Because it represents that reality, it should be also comprehensible and make sense both to the persons who were studied and those practising in that area. If the data upon which it is based are comprehensive and the interpretations conceptual and broad, then the theory should be abstract enough and include sufficient variation to make it applicable to a variety of contexts related to that phenomenon. Finally, the theory should provide control with regard to action toward the phenomenon. This is because the hypothesis proposing relationships among concepts-which later may be used to guide action-are systematically derived from actual data related to that (and only that) phenomenon" (Strauss & Corbin, 1990: 23).

### **3.4.2.1.1 HISTORY**

Grounded Theory as a methodology was initiated and developed by two sociologists: Barney Glaser and Anselm Strauss at the University of California-San Francisco. The two researchers worked collaboratively on a project studying patients; the study led to the development of a set of techniques for the analysis of qualitative data, which was called Grounded Theory.

The original book on Grounded Theory was published in 1967 under the title "*The Discovery of Grounded Theory*". After this book was published, a series of articles and other books followed in the next thirty years. A few years later in 1978, Glaser published another book under the title "Theoretical Sensitivity" and after that a third one emerged in 1987 by Strauss with the title "Qualitative Analysis for Social Scientists". In 1990, Anselm Strauss (one of the writers of the original Grounded Theory book) and Juliet Corbin attempted to write a book on Grounded Theory in a clearer and more straightforward manner, as the original one creates certain difficulties in understanding. The original book needs the researcher's personal interpretation, as it sometimes leads to misunderstandings of the theory, its techniques and its exact procedures.

The book by Strauss and Corbin is intended to provide a basic knowledge of the procedures and techniques of Grounded Theory needed by the researcher who is going to conduct their first qualitative analysis research project based on the above theory. In my opinion, Strauss and Corbin have succeeded in their aim, as their book is very well written and comprehensible compared to the original one. A newer and more updated version followed in 1998 that contains more examples of Grounded Theory research projects in application.

Later Glaser and Strauss worked separately and followed different ways in the development and refinement of Grounded Theory, frequently not hesitating to use strong language regarding each other's books. Glaser in his recent book "Basics of Grounded Theory Analysis" published in 1992 argued that Strauss never actually understood the techniques of the Grounded Theory approach. Babchuk (1997) provides us with a detailed comparison of the differences between Glaser's and Strauss' interpretation of Grounded Theory.

### **3.4.2.1.2 WHAT IS A GROUNDED THEORY?**

The Grounded Theory approach, inductive in nature, uses a set of techniques to try to discover and capture human behaviour with the purpose of developing theory about a phenomenon (Strauss & Corbin, 1990: 24).

“A Grounded Theory is one that is inductively derived from the study of a phenomenon it represents. That is, it is discovered, developed and provisionally verified through systematic data collection and analysis of data, pertaining to that phenomenon...One does not begin with a theory, then prove it. Rather, one begins with an area of study and what is relevant to that area is allowed to emerge” (Strauss & Corbin, 1990: 23).

Grounded Theory is nothing else but a qualitative research method that uses a systematic set of procedures to develop a theory about a phenomenon that has been under study. A well-structured Grounded Theory will meet four central criteria: fit, understanding, generality and control. If theory is faithful to everyday life then it should fit that area. On the other hand, it should be comprehensible and make sense. Additionally, it should be abstract enough and it should allow generalities. Finally, the theory should provide control with regard to action toward the phenomenon.

For Strauss and Corbin (1998) "theory derived from the data is more likely to resemble the reality than is theory derived by putting together a series of concepts based on experience or solely through speculation. Grounded theories because they are drawn from data, are likely to offer insight, enhance understanding, and provide a meaningful guide to action" (p.12).

### ***3.4.2.1.3 THEORETICAL SENSITIVITY***

Theoretical sensitivity is a term that has been associated with Grounded Theory. In fact, a whole book written by Glaser in 1978 bears that title. Theoretical sensitivity is the ability of the researcher (his/her personal quality) that gives him/her the capability to understand what is essential in the data, the capacity to separate the important and to give it a meaning.

"Theoretical sensitivity refers to a personal quality of the researcher. It indicates an awareness of the subtleties of the meaning of data. Theoretical sensitivity refers to the attitude of having insight, the ability to give meaning to data, the capacity to understand, and capacity to separate the pertinent from that which isn't" (Strauss & Corbin, 1990: 41).

Every researcher comes to the research situation with different degrees of sensitivity that depend upon previous reading and experience. Theoretical sensitivity comes from different sources. The first one is the reading of the literature, technical or non-technical (a strong background of information on the topic). The reading of the literature makes the researcher more “sensitive” to the phenomenon under study. The reading of the literature has been used in our case at the beginning of our research when we were trying to clarify the research questions and design the interview schedule. However, the literature has also been used throughout the course of this research, as we always tried to be keep up-to-date with what was

going on in our area of study. At the end of the study a new literature search has been used in the light of the findings of the research, in order to add validity to the findings.

The second source of the theoretical sensitivity is professional experience.

“Throughout years of practice in a field one acquires an understanding of how things work in that field, and why, and why will happen there under certain conditions” (Strauss & Corbin, 1990: 42).

However, theoretical sensitivity can also be acquired during the research project through the collection and analysis of the data and through continual interactions with the data. In our case, theoretical sensitivity was gained through participation in the INF 103-Elements of Information Management, where I was performing demonstrations of the on-line computing sessions for three years, and I also presented a couple of the lectures.

The third source of theoretical sensitivity is personal experience that has been gained by personal interaction with the on-line group environments.

Finally, the last source of theoretical sensitivity is the "analytic process": the researcher gains understanding of the phenomenon under study through constant comparisons and development of concepts through interaction with the data (Strauss & Corbin, 1990: 42, 43).

#### ***3.4.2.1.4 CODING PROCEDURES***

The style of Grounded Theory is based on a number of features such as theoretical sampling, the making of constant comparisons and the use of a coding programme. The starting point of Grounded Theory analysis is data collection, which is the gathering of information and materials the researcher is going to analyse. Theoretical Sensitivity, as has been described in the previous sections, helps in making comparisons, and finding variations and relationships in the data. Using the data derived from the interviews the researcher begins to build his/her theory that is based on constant comparisons. The comparisons help in the formation of similarities and differences among the pieces of data.

“Coding represents the operations by which data are broken down, conceptualised and put back together in new ways. This is the central process by which theories are built from the data” (Strauss & Corbin, 1990: 57).

There are three types of coding in Grounded Theory: 1) **open**, 2) **axial**, and 3) **selective** coding.

**Open coding** is the first examination of the data in order to categorise and name the phenomena deriving from the data.

“During open coding the data are broken down into discrete parts, closely examined, compared for similarities and differences and questions are asked about the phenomena as reflected in the data. Through this process one’s own and other’s assumptions about phenomena are questioned or explored leading to new discoveries” (Strauss & Corbin, 1990: 62).

The first procedure is to give names to the things, events, incidents and phenomena arising from the data, being careful to put together similar phenomena giving them the same name. As dozens of labels and names might emerge, related concepts were grouped together. The process of grouping is called "categorising". Each category is given a conceptual name that can be changed in the future if considered necessary. Usually, a name that was graphic enough to represent the data was chosen either borrowed from: 1) the literature, 2) the interviewees (in vivo coding).

“There are several guidelines for "open coding" which tend to insure its proper use and success. The first guideline is to ask a set of questions of the data ... What is data pertinent to? ... What category does this incident indicate? ... What is actually happening in the data? ... What is the main story here, and why? These questions tend to force the generation of a core category or categories which will be at the centre of the theory and its eventual write up” (Strauss & Corbin, 1990).

Each category has different properties that are the characteristics of a category, and each property is expressed in different dimensional forms that give more existence and depth to each core category.

"Properties are the general or specific characteristics or attributes of a category, dimensions represent the location of a property along a continuum or range...qualifying of a category by specifying its particular properties and dimensions is important because we can begin to formulate patterns along with their variations...patterns are formed when groups of properties align themselves along various dimensions" (Strauss & Corbin, 1998: 117).

During the open coding procedure the data was coded giving descriptive and graphic names to each code, often renaming again and again as new data was introduced. The name of the codes came from the literature but mostly the "in vivo" naming technique was used as it was felt to be closer to the grounded theory philosophy. A serious number of codes (around 600) emerged. The number of codes diminished later on as material not fitting in any of the categories were discarded. During the open coding procedure each code was also developed along the line of its properties and dimensions.

**Axial coding** refers to the process of coding around a single category. As in open coding we have broken down the data in order to produce categories with properties and dimensions axial coding "puts data back together in new ways by making connections between a category and its subcategories...in axial coding our focus is on specifying a category in terms of its

conditions that give rise to it; the context in which it is embedded; the action/interaction strategies by which it is handled, managed, carried out; and the consequences of those categories" (Strauss & Corbin, 1990: 97).

Furthermore, additional properties of each category were looked for and the dimensional location of each event and incident was noted. In other words, in axial coding the researcher moves all the time between inductive and deductive thinking. "That is, we deductively propose statements of relationships or suggest possible properties and their dimensions when working with data, then actually attempt to verify what we have deduced against data as we compare incident with incident. There is a constant interplay between proposing and checking. This back and forth movement is what makes our theory grounded!" (Strauss & Corbin, 1990: 111).

The link of the subcategories of a category and the set of their relationships they form results in the Paradigm Model that includes the *phenomenon* that is arising under certain *causal conditions*, the *context* and the *intervening conditions* pertaining to the phenomenon, the *action/interaction strategies* adopted, and the results or *consequences* the phenomenon has. The Paradigm Model enables us to think systematically about our data, and the relationships coming up if we try to relate our codes in complex ways.

Let us be more specific about these categories and their relationships as the Paradigm Model is one of the most important features of the Grounded Theory, and as Strauss and Corbin (1990) point out "unless you make use of this model, your Grounded Theory analysis will lack density and precision" (p.99).

The **causal conditions** are describing the events or the incidents that lead to the occurrence or development of a phenomenon. They are different causal conditions that produce a phenomenon. We are trying to describe what is actually causing the phenomenon under study, and the properties of the causal conditions. The researcher should be aware when finding words like "when", while, "since", "because", "due to", "on account of". We can also identify the number, the type and the degree of the causal conditions (Strauss & Corbin, 1990: 100-101).

The **phenomenon** is a term that answers the questions, "what is the data referring to?". "Looking for phenomena we are looking for repeated patterns of happenings, events that represent what people do or say, alone or together, in response to the problems and situations in which they find themselves" (Strauss & Corbin, 1998: 130).

The **context** is the set of properties pertaining to a phenomenon, trying to describe the problems, issues, happenings or events pertaining to the appearance of a phenomenon.

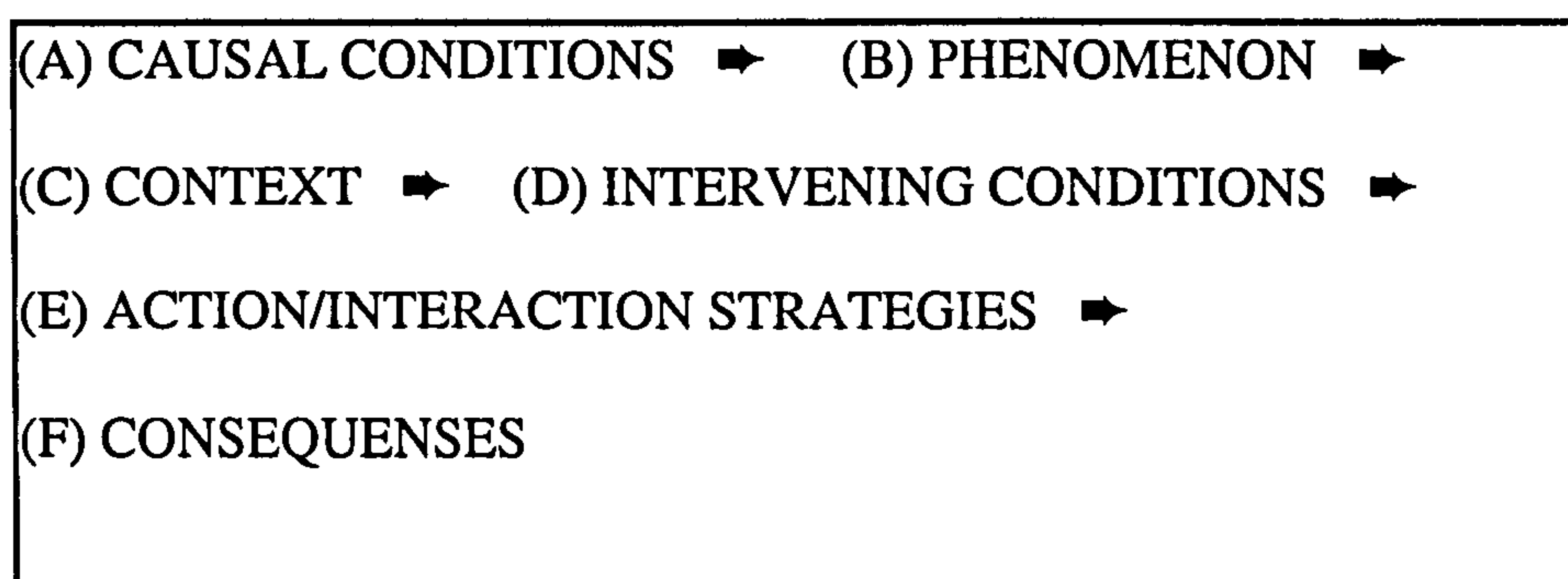
"Contextual conditions are the specific sets of conditions (patterns of conditions) that intersect dimensionally to create the set of circumstances or problems to which persons respond through actions/interactions" (Strauss & Corbin, 1998: 132).

**Action/interaction** are the **strategies** by which the phenomenon is handled, managed and carried out. They are strategic responses made by individuals to issues, problems, happenings, and events. The Action/Interaction strategies of persons, organisations, communities in response to problems and issues arise from the causal conditions. They present the way people act and interact (Strauss & Corbin, 1990: 104-105).

The **intervening conditions** act to either facilitate or constrain the action/ interaction strategies. They mostly refer to time, space, culture, economic status, technological status, career, history, and individual biography. The researcher will have to show how the intervening conditions facilitate or constrain action/ interaction strategies (Strauss & Corbin, 1990: 103).

The action/ interaction taken to manage a phenomenon has certain outcomes or **consequences**. With consequences, we are trying to describe what has happened as a result of the action/ interaction strategies, or the failure of persons to respond to situations. Consequences mainly refer to people, places and things (Strauss & Corbin, 1990: 106).

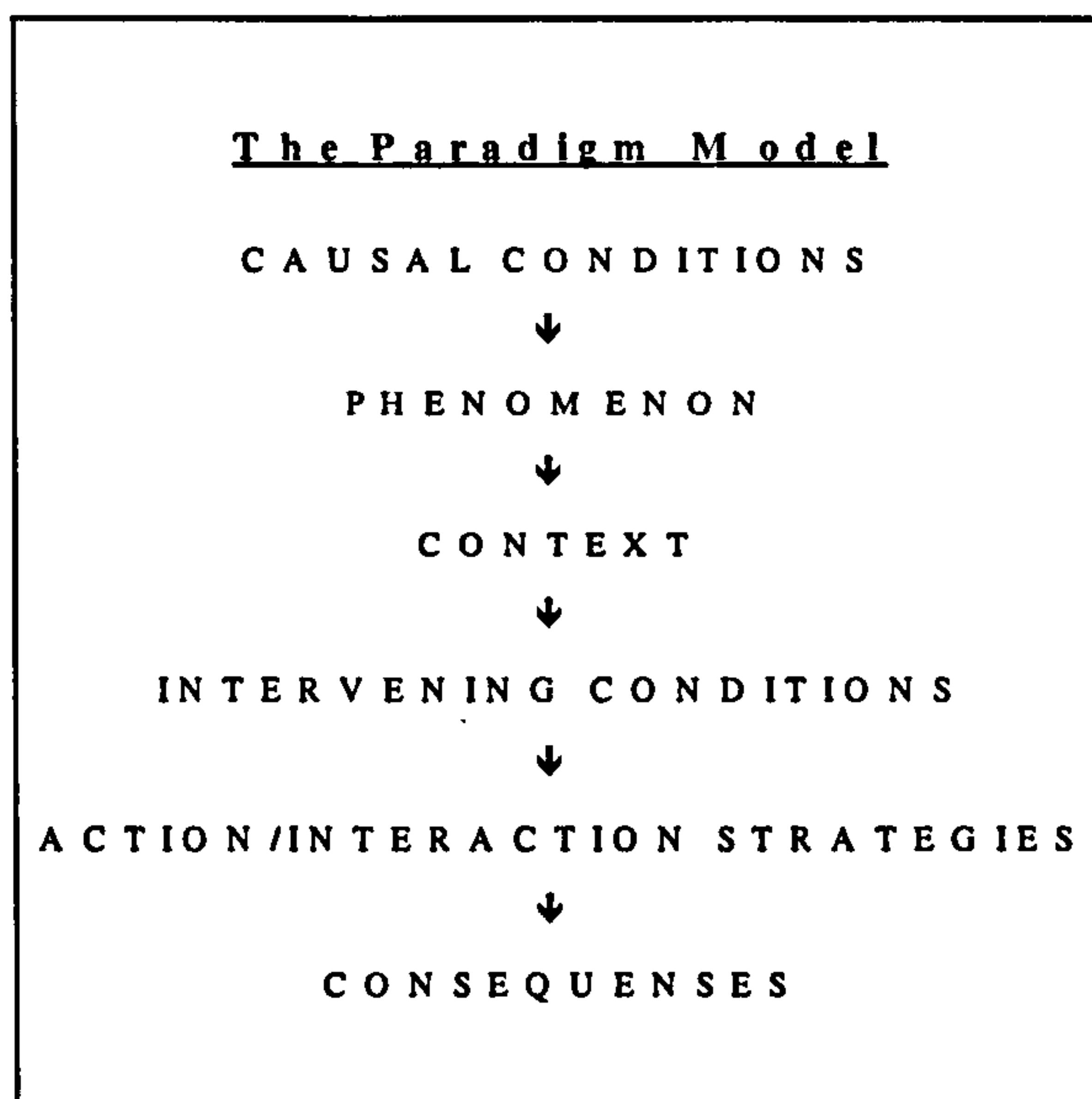
Strauss and Corbin (1990) have graphically represented the relations between the features of the Paradigm Model in a horizontal form. They represent the model to look as in the following Figure 3.2:



*Figure 3.2- The Paradigm Model: Strauss & Corbin, 1990: 99*

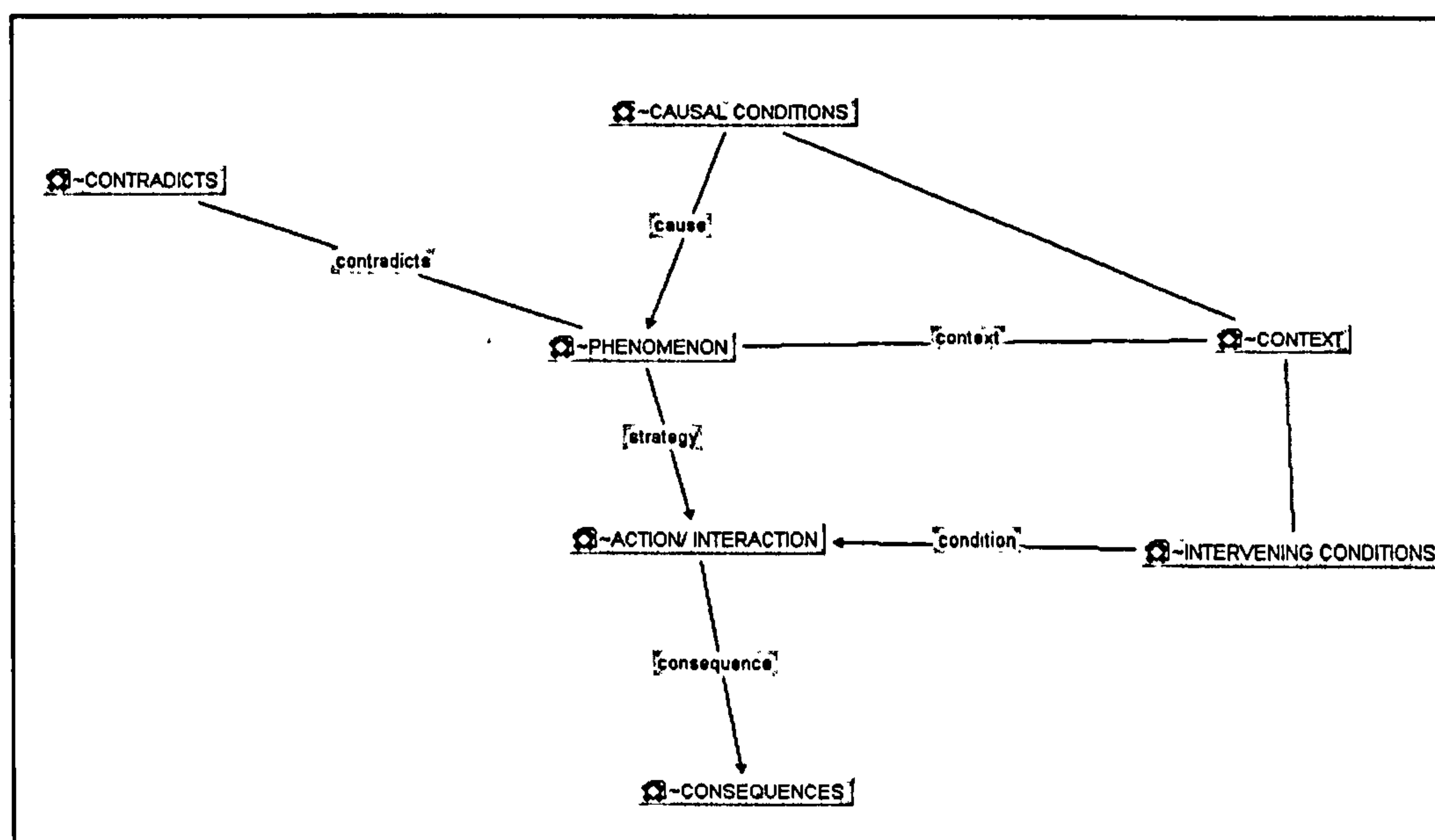
Pandit (1996) who has applied Grounded Theory in a research project came up with a vertical representation of the features of the Paradigm Model looking like the following Figure 3.3:





*Figure 3.3- The Paradigm Model: Pandit, 1996*

My personal interpretation of the Axial Coding Structure differs graphically from the previous two models. I tend to think of the axial coding structure both vertically and horizontally. For a graphical representation of my personal interpretation of the Axial Coding Structure see the following Figure 3.4.



*Figure 3.4- Axial Coding Structure*

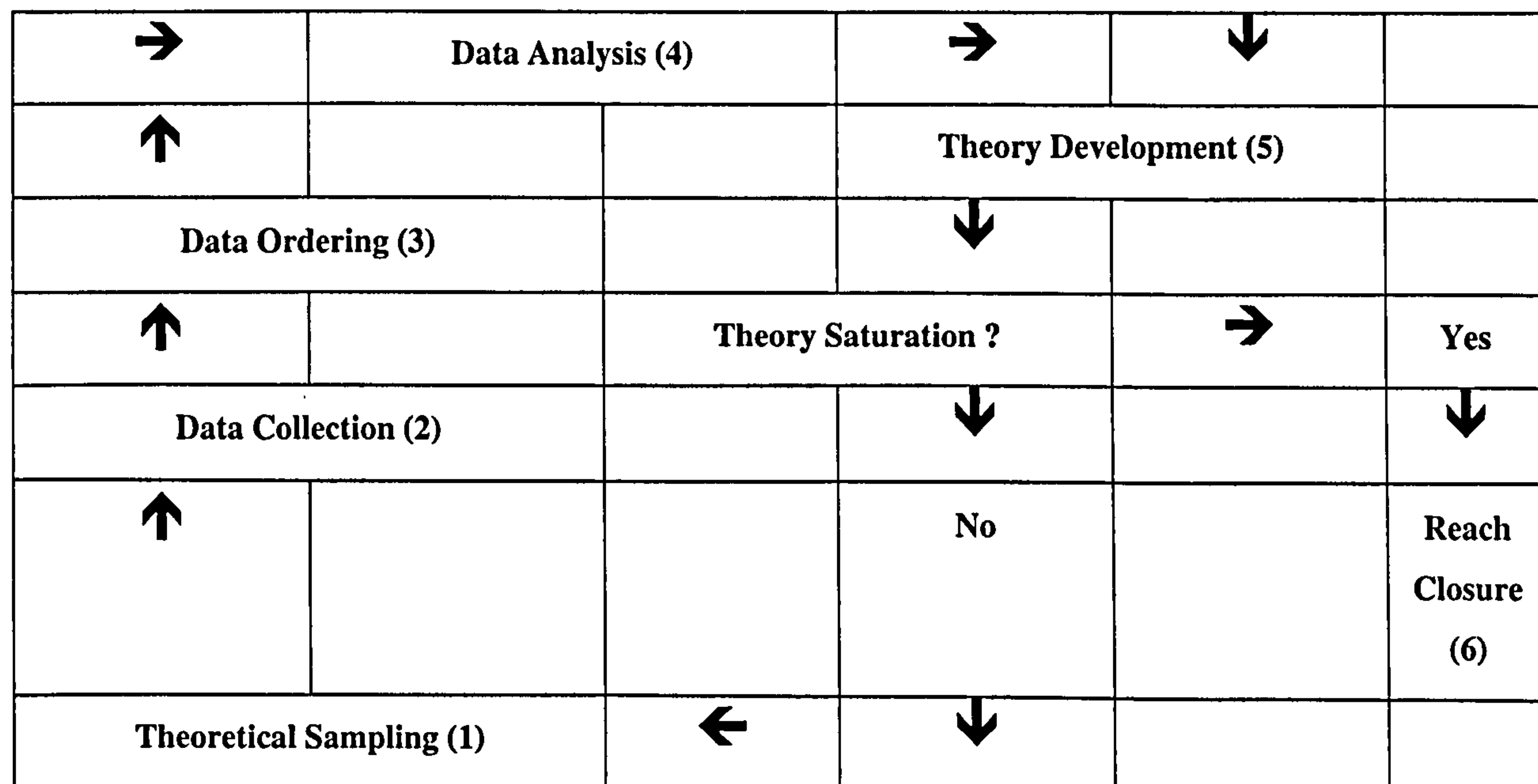
The previous axial coding structure has been used for identifying the conditions, action strategies and consequences of each category emerged during the course of our data analysis.

After going through all the previously presented steps, a category will reach the point of its theoretical saturation, that is the criterion for judging it is time to stop developing a category.

"Saturation means that no additional data are being found whereby the sociologist can develop properties of the category. As he sees similar instances over and over again, the researcher becomes empirically confident that a category is saturated...when one category is saturated nothing remains but to go on to new groups for data on other categories, and attempt to saturate these categories also. When saturation occurs, the analyst will usually find that some gap in his theory, especially in his major categories, is almost, if not completely filled" (Glaser & Strauss, 1967: 61).

As the same authors point out the criteria for "determining saturation are a combination of the empirical limits of the data, the integration and density of the theory, and the analyst's theoretical sensitivity" (Glaser & Strauss, 1967: 62).

For Pandit (1996) the point of the theoretical saturation is also the point of reaching the closure of the research. He has tried quite successfully to represent the different stages a researcher will have to come through until he/she reaches the point of theoretical saturation (Figure 3.5). In our case the following procedures for reaching theoretical saturation have been followed up to the point we developed each category individually when no new data was coming out and the interviewees would kept repeating previously mentioned points of view.



*Figure 3.5- Theoretical Saturation: Pandit, 1996*

**Selective coding** is the process of selecting a core category that is the central phenomenon that arises from the data. All the other categories are integrated and related around the core

category. Selective coding also requires the validation of the relationships among the core categories and the other categories and the “filling in” of categories that need further refinement and development (Strauss & Corbin, 1990: 116).

However, there are several steps that will lead to the "integration" of the categories to form a Grounded Theory. "The first step involves explicating the story line. The second consists of relating subsidiary categories around the core category by means of the paradigm. The third involves relating categories at the dimensional level. The fourth entails validating those relations against the data. The fifth and final step consists of filling the categories that may need further refinement and/or development" (Strauss & Corbin, 1990: 117-118).

The first step of integration is the decision over the central/core category. In doing so there are six different criteria that must be met:

- the core category must be related to most of the other categories
- a core category must appear quite frequently in the data
- the explanation that evolves by relating the categories is logical and consistent; there is no forcing of data
- the description must be leading to a more general theory that can be used to do research in other areas
- as the concept is refined analytically the theory grows in explanatory power
- it must allow the maximum variation in the analysis (Strauss, 1987).

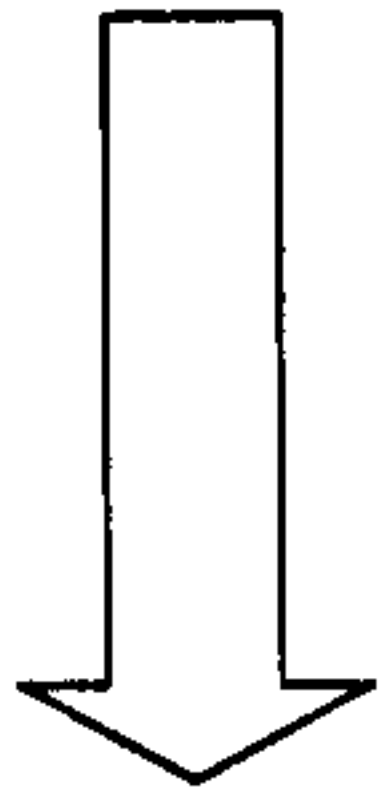
For a graphical representation of the Grounded Theory's coding procedures based on our interpretation, see next Figure 3.6.

## CODING PROCEDURES

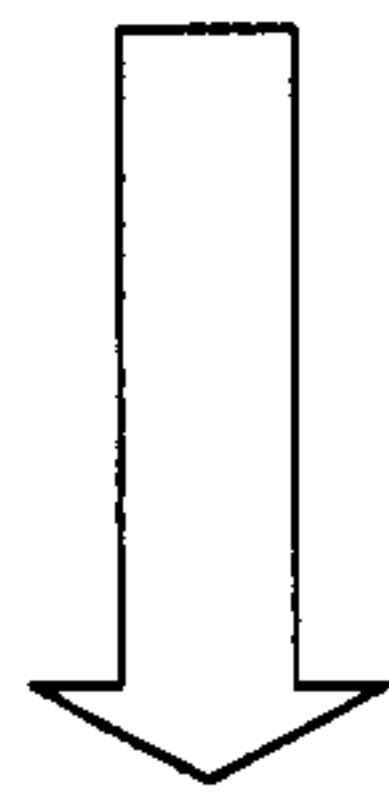
**DATA COLLECTION**



**OPEN CODING**



**AXIAL CODING**



**SELECTIVE CODING**

NAMES (Labelling the phenomena)



↓ group the labels  
CATEGORIES (Categorising  
the phenomena)  
↓ creating subcategories

PROPERTIES (Characteristics of a category)



DIMENSIONS (Locations of a property)



DEVELOPMENT of Each Category

CAUSAL CONDITIONS



IDENTIFICATION of CONTEXT



INTERVENING CONDITIONS



ACTION/INTERACTION STRATEGIES



CONSEQUENCES

SELECTION of Core Categories



VALIDATION of Relationships among  
Categories



REFINEMENT of Categories)

*Figure 3.6-Coding Procedures in Grounded Theory*

### 3.4.2.1.5 MEMOS

As has been stressed by the developers and most of the researchers applying Grounded Theory, one of the most important features of it is the writing of memos.

“Writing Theoretical Memos Is an Integral Part of Doing Grounded Theory. Since the analyst cannot readily keep track of all the categories, properties, hypotheses, and generative questions that evolve from the analytical process, there must be a system for doing so. The use of memos constitutes such a system. Memos are not simply about "ideas". They are involved in the formulation and revision of theory during the research process...memo writing should continue until the very end of the project, often including the writing itself. Sorted and resorted during the writing process, theoretical memos provide a firm base for reporting on the research and its implications. If a researcher omits the memoing and moves directly from coding to writing, a great deal of conceptual detail is lost or left undeveloped” (Corbin & Strauss, 1990: 10).

Glaser and Strauss (1967) also stressed the importance of memo writing:

"From the point of view of generating a theory is often useful to write memos on, as well as code, the copy of one's field notes. Memo writing on the field note provides an immediate illustration for an idea. Also, since an incident can be coded for several categories, this tactic forces the analyst to use an illustration only once, for the most important among the many properties of diverse categories that it indicates" (p.108).

At the initial stages of the data analysis there was less concentration on the writing of memos. Then, as time went by, it was realised that interesting ideas on how to proceed would be lost, if they were not written down. Therefore, the importance of writing memos and keeping them in order was appreciated in practice.

However, what do you include in a memo? You can actually include everything that comes to your mind, any brainstorming ideas, even if something sounds quite irrelevant when you are writing it up, it may be useful later. So, the advice is to write anything that crosses your mind down, any idea or hypothesis that might apply to the data under study.

Pandit (1996) indicates that there must be at least three different types of memos that can be used namely: code memos, theoretical memos and operational memos. The *code* memos refer to the open coding, the *theoretical* memos refer to axial and selective coding, and the *operational* ones contain directions relating to the evolving research design.

In undertaking the current research three different types of memos were used with the help of the ATLAS.ti software namely:

- Quotation memos
- Code memos

- General theoretical memos.

The Quotation memos were comments connected to a very specific quotation. They were used to stress the importance of a specific quote on something, and they came up every time we made an output of the quotations connected to a specific code. That helped when making connections between a code and more specific quotations in order to illustrate a finding or a different aspect of the theory.

The Code memos served the need to explain what the specific code meant, and what the code was referring to. In addition, the code relations with other codes were discussed. This type of memo referred to the open and axial coding respectively. They served in a way the same purpose as Pandit's (1996) *code* and *theoretical* memos.

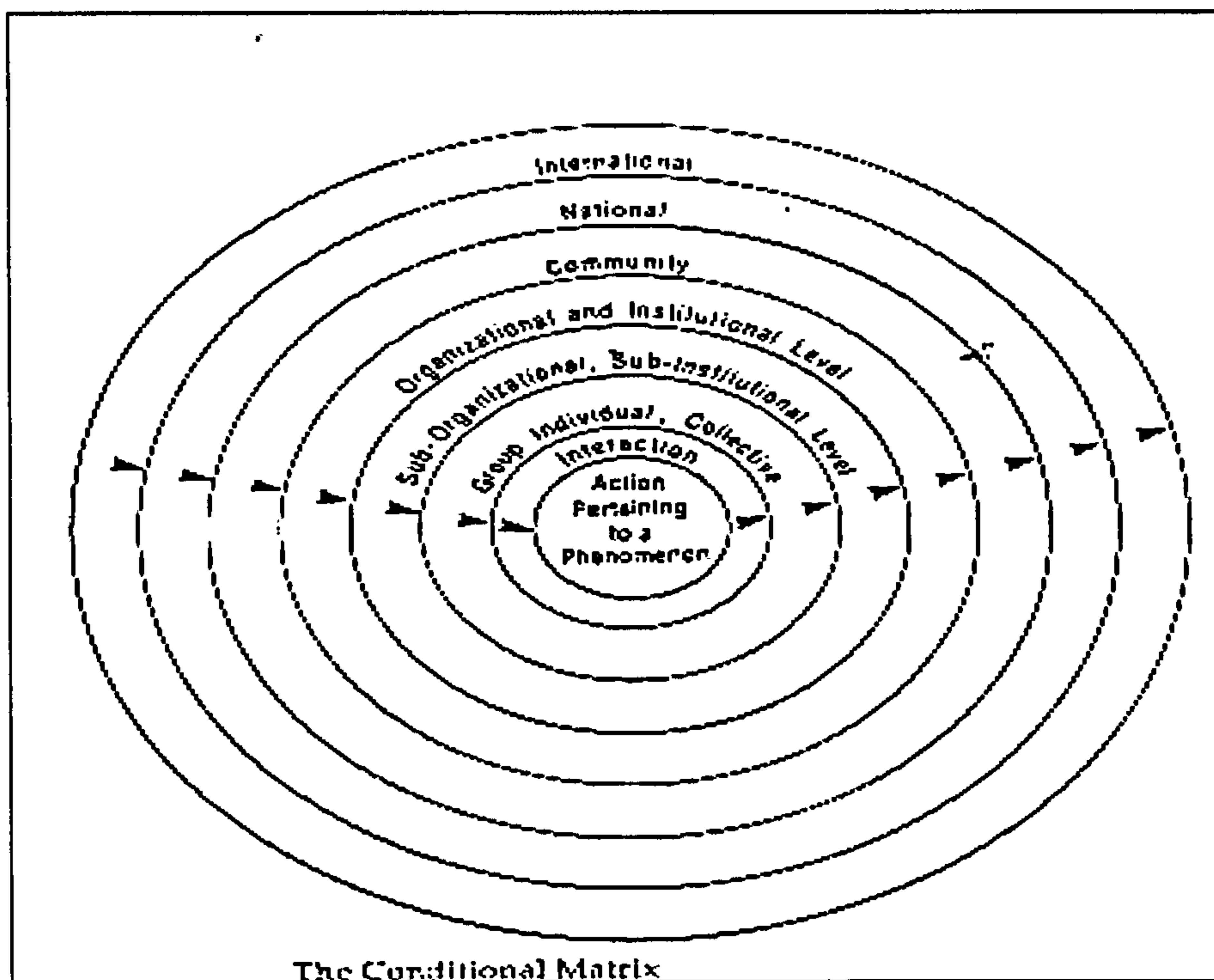
The third type of memos that were utilised, the General ones, were more holistic, more theoretical in nature, and represented assumptions and hypotheses that would have to be justified by actual data. In other words, the General memos were closer to the building of theory. They were both *theoretical* and *operational* in nature according to Pandit's (1996) model.

However, when you are writing up memos, it is a difficult task to construct the same series of thoughts at a later stage. In order to solve this problem of reading the memos at a later stage of the research all three different types of memos were placed in chronological order. Every time a new memo was made we would put the date first. Keeping memos in chronological order assisted their archiving because it helped to categorise thought and to remember. It is a difficult task to recollect what was meant when writing something after a long time.

Additionally, memo writing in chronological order allowed the structure of thought to be followed, and sense to be made of it even after a long time.

#### **3.4.2.1.6 THE CONDITIONAL MATRIX**

Strauss and Corbin (1990) present a very effective diagram on which they explain how a wide range of conditions and consequences can be related and can be affect a phenomenon under study. This analytic tool is called conditional matrix and it can help us to explain the whole range of conditions that can affect the on-line group dynamics. The conditional matrix can be represented as a set of circles one inside the other, each corresponding to different aspects of the world around us (as Figure 3.7 indicates).

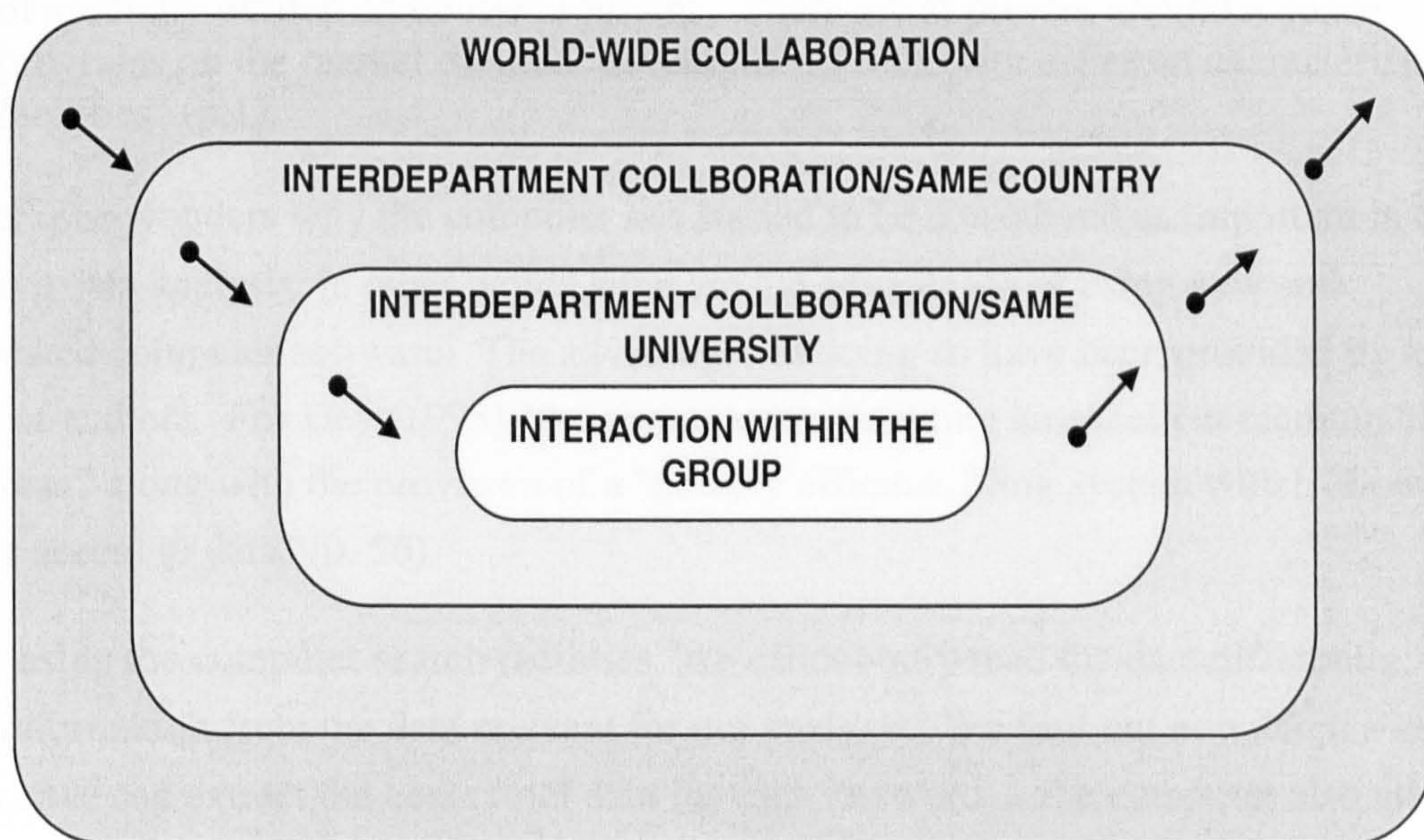


*Figure 3.7- The Conditional Matrix: Strauss & Corbin, 1990: 163*

For Strauss and Corbin (1990) “conditions at all levels of the conditional matrix have relevance to any study. Even when studying a phenomenon that is clearly located at the inner part of the matrix-the action/interaction level the broader levels of conditions will still be relevant” (Strauss & Corbin, 1990: 161-162).

Therefore, the researcher needs to fill in the specific conditional features for each level that pertain to the chosen area of investigation. Strauss and Corbin (1990) also notice that regardless of the level within which a phenomenon will stand in conditional relationship to levels above and below it as well as within the level itself (Strauss & Corbin, 1990:162).

With the use of the conditional matrix that has been given by Strauss and Corbin (1990) we can produce the diagram of our study to represent the context which the present study is placed as shown in Figure 3.8.



*Figure 3.8- The Conditional Matrix*

The main interest of the study concentrates on student interaction via the use of the on-line group environments. However, the phenomenon of the student-to-student interaction will have to be seen also in its relationship to other levels of the “conditional matrix”. So, if the arrows starting from the inside box represent the main aim of the study the phenomenon also has to be seen in connection to its expansion to the other areas above it which are inter-department collaborative learning, on-line collaboration in the same country, world-wide on-line collaboration. The two lines that cross all the boxes represent the student to student interaction, and student to teacher interaction. They actually represent this study and how all areas of the "conditional matrix" can effect it.

### **3.4.3 THE USE OF COMPUTER-ASSISTED QUALITATIVE DATA ANALYSIS SOFTWARE (CAQDAS)**

In the past, the way researchers were doing qualitative research was mainly based on paper and scissors. Especially, when they wanted to apply and illustrate the relationships among their data they would have to cut and paste all the time, so they would end up with a massive pile of paper. However, things have changed dramatically recently in the field of qualitative data analysis through the use of computer programs that aim to make the analysis easier and more accurate. That has been also pointed out by Fielding and Lee (1991):



"there has been considerable progress in the analysis of qualitative data using a variety of specially written computer programs. There are at present around a dozen programs on the market or under development, each with different characteristics and facilities" (p.1).

However, one wonders why the computer has started to be considered as important in the qualitative data analysis, in other words what are the advantages of using new and sophisticated computer software. The advantages in doing so have been provided by a number of authors. For Dey (1993) "the computer is providing an excellent medium of storing data" along with the provision of a "notably efficient filing system which allows quick and easy access to data" (p. 56).

Also by using the computer search facilities "we cannot only read the data differently, we can extract information from the data relevant for our analysis. We find out how often a keyword appears...we can extract the contextual data for each keyword....the computer also allows us to create new pathways through the data...we can create links between different parts of the data" (Dey, 1993: 58-59).

These types of links are known as "hypertext" or "hypermedia" links and they are very useful during qualitative analysis because they allow us to make comparisons between different types of data and "ask questions about the relationships of categories" (Richards & Richards, 1994: 152).

Software specially designed for qualitative research also facilitate the coding procedure as a "coding scheme can be developed and recorder as an electronic dictionary, thesaurus or authority file of key words, phrases, categories and definitions" (Richards & Richards, 1994: 152). An additional advantage would also be the memo-writing (Richards & Richards, 1994) that is the reflections on the conceptual meaning of data that will lead to the "theory building through the development of systematic, conceptual coherent explanations of the findings" (Rice-Lively, 1997: 214).

However, next to the numerous advantages the qualitative analysis software some of the researchers are expressing their concern on its use. Dey (1993) for instance is expressing the reservation that the use of the computer can encourage the application of a "mechanistic" approach to analysis, as the "technology takes over from the task and data that cannot be analysed by the computer is ignored" (p.61). For Rice-Lively (1997) there is the fear that the researcher would be removed intellectually from the data. Barry (1998) also expressed his concerns on the use of the computers during the analysis pointing out that that something like that could distance people from their data, and that there would be the fear to analyse qualitative data by using quantitative method. In our personal opinion all the above concerns can be overtaken by the advantages the software packages have to offer that are promising to

help the researchers perform better their analysis. On the other hand, the researcher can use the software up the point that is useful to him/her in order to facilitate and not constrain the research analysis.

### **3.4.3.1 SOFTWARE EMPLOYED FOR THE DATA ANALYSIS**

Having decided on the use of computer assisted qualitative data analysis, the next step for the researcher would be the choice of the specific software, the one that would offer the most advantages and that would be considered to be the suitable to one's personal needs.

A number of computer software that can be used to assist the analysis of qualitative data is currently available in the market, such as: ATLAS/ti, The Ethonograph, Folio VIEWS, Hyper Qual, HyperRESEARCH, Inspiration, NUD.IST, QUALPRO, SemNet. It is up to the researcher to decide which one is the most appropriate one for the type of analysis wishes to apply.

The importance of using a computer program to help the researcher analyse the data emerge through qualitative methods has been stressed by the developers of the Grounded Theory in a recent publication when talking about memos and diagrams:

"they are devices that depict the relationships among concepts. Both are important ways of keeping records of analysis and can be done the old-fashioned way (i.e., by hand) or by using one of the newer computer programs designed for that purpose, such as ATLAS or NUD.IST" (Strauss & Corbin, 1998: 218).

As the developers of the Grounded Theory suggested to the grounded theorist, the two previously referred software products a good starting point for our selection of the most appropriate one.

Weitzman and Miles (1995) have reviewed both ATLAS.ti and NUD.IST among other computer programs for qualitative data analysis and they have concluded that these two are the most important ones in their category. However, they add that the researcher will have to weigh up their strengths and weaknesses against his/her personal needs. Additionally, other authors have tested both software packages coming to similar conclusions. As for instance, Walsh and Lavalli (1996) concluded that NUD.IST is widely accepted in the academic world...for strictly academic research seems to have rightly established market share. However, ATLAS.ti is powerful and smart, good for working with text and with graphic data, and it supports quick and creative theory building. Additionally, training time to fully utilise ATLAS.ti is substantially less than with NUD.IST.

However, Barry (1998) has done the most serious comparison between the two different software and their applications. Barry (1998) argues that ATLAS.ti and NUD.IST are appearing to be the most serious contenders in meeting the requirements of the researchers in coding and theory building and choosing between the two software could be difficult. Barry's analysis was based on two dimensions that were the "structure of the software" and the "complexity of the research project". She concludes NUD.IST tends to win out on sequential structure, project management and sophisticated searching while ATLAS.ti strengths lie in its "inter-conceitedness" and creative interface. However, she adds that whichever route someone will take using any software can benefit and enrich the analysis process.

#### ***3.4.3.1.1 NUD.IST***

Initially, it was decided to use the NUD.IST software to help with the analysis of the data. This decision was partly forced by the existence of the specific software under the university's network. NUD.IST stands for Non-numerical Unstructured Data Indexing Searching and Theorising. It is used to handle different kinds of data including reports and transcripts of unstructured conversational interviews that makes it particularly useful for all interview data. The NUD.IST is used to help its users to:

- manage, explore and search the text of documents;
- manage and explore ideas about the data;
- link ideas and construct theories about the data;
- test theories about the data, and
- generate reports including statistical summaries (NUD.IST software- User's Manual).

However, after a couple of months of use the software's inappropriateness and unsuitability to the research needs became clear. The need for user-friendly and more powerful software was identified. Therefore, the decision was taken to start looking for other software available on the market. The next step was the testing of the ATLAS.ti software package, as Strauss and Corbin (1998) suggested. A demo version was downloaded from the Web and used in comparison with NUD.IST for a while. A period of only two weeks of comparative use proved a sufficient for a decision to be made.

### **3.4.3.1.2 ATLAS.TI**

The functions of the ATLAS.ti software as been described by the developer can be summarised as the following:

- help you organise your text (interviews)
- facilitate the activities of selecting, organising and comparing segments of data
- search, retrieve and browse data segments
- build networks enabling you to construct concepts and theories based on the relations arising from your data
- allow you to use networks to explore and discover the "texture" of your data-its interwoven meanings.

(Muhr, T. (1997), ATLAS.ti software- User's Manual, Berlin)

Finally, we decided to use ATLAS.ti over NUD.IST basing our decision on a number of reasons.

### **3.4.3.1.3 ATLAS.TI VERSUS NUD.IST**

#### **NUD.IST**

- If NUD.IST is being used there is a need to build the hierarchy of root trees. There is a need to decide at the beginning of the analysis where each code needs to be placed. This approach was found not to be close enough to the Grounded Theory Approach as the researcher needs to be 100% sure about what is going on in the data from the beginning of the analysis. In other words, such an approach does not allow the flexibility someone needs when applying an open-ended Grounded Theory.
- Consequently, there is a need for the researcher to have more concrete ideas from the beginning about the research of what is going on in the data.
- Furthermore, NUD.IST requires the use of additional software for the production of Graphical Presentations of the relations among the different codes, such as Decision Explorer or Inspiration (Barry, 1998).

## ATLAS.ti

On the other hand:

- In ATLAS.ti all the codes are at the same level of importance and priority at the beginning of the coding procedures.
- This means that the Relations are built step by step as the analysis continues. The core categories and their properties emerge as the analysis develops. In a way that suits a Grounded Theory Approach better.
- While NUD.IST has only one relationship defined among the nodes, ATLAS.ti has a number of relationships defined as "is a cause of", "is a part of", "it is associated with", etc. The user can also identify his/her own relationships. In our case we created our own relationships defining them as "causes", "contextual conditions", "intervening conditions", "action/interaction strategies", "contradictions" and "consequences", that were used along with the pre-existing relationships to form Grounded Theory axial coding diagrams.
- One of the most important features of the ATLAS.ti is the existence of Networks that allow theory building and making connections between the data. The Networks reveal the relationship between the categories and its subcategories, and among the main categories themselves.
- It is possible to export data into SPSS Jobs.
- It is possible to create Hypertext pages.

Undoubtedly, ATLAS.ti has proved to be much more elegant and User Friendly in comparison to NUD.IST, or this is a matter of my personal preference. After all, coming to choose software to help analyse data is always a matter of personal preferences. In general, ATLAS.ti was found to be very helpful and close to the principles of the Grounded Theory Approach that we intended to apply.

### 3.5 VALIDITY AND RELIABILITY

Both qualitative and quantitative research are based on assumptions which establish the validity of certain research and which also suggest which research methods are more appropriate (Myers, 1997).

The issue of validity in qualitative research is a controversial one as some qualitative researchers reject the concept of validity that appears to be common in quantitative approaches. Winter (2000) argues that 'validity' is not a "single, fixed or universal concept, but rather a contingent construct, inescapably grounded in the processes and intentions of particular research methodologies and projects".

Winter (2000) quoting Hammersley (1987) provides us with a summary of definitions on validity and reliability, some of which are shown in the following Table 3.1.

<p><b>"validity"</b></p>	<p>'Accuracy' -- Lehner (1979, p. 130)</p> <p>Degree of approximation of 'reality' -- Johnston and Pennypacker (1980, pp. 190-191)</p> <p>'Are we measuring what we think we are?' -- Kerlinger (1964, pp. 430, 444-445)</p>
<p><b>"reliability"</b></p>	<p>'Ability to measure consistently' -- Black and Champion (1976, pp. 232-234)</p> <p>Reproductibility of the measurements...stability' -- Lehner (1979, p. 130)</p> <p>'Capacity to yield the same measurement...stability' -- Johnston and Pennypacker (1980, pp. 190-191)</p> <p>'Accuracy or precision of a measuring instrument?' -- Kerlinger (1964, pp. 430, 444-445)</p>

*Table 3.1- Summary of Definitions on Validity and Reliability: Winter, 2000*

By the definitions given it seems that validity deals mostly with accuracy and reliability with stability. Several authors tried to overview alternative opinions or to establish guidelines and criteria for assessing validity and reliability in qualitative research (Athens, 1984; Lincoln & Guba, 1985; Guba, 1990; Hammersley, 1990; Dingwall, 1992; Altheide & Johnson, 1998). However, in our study we used Lincoln and Guba's concepts of validity. Lincoln and Guba

(1985) notice that inquirers traditionally pose themselves four questions, the ones of "truth value", "applicability", "consistency" and "neutrality". Therefore, they suggested four alternative criteria for assessing the "trustworthiness" of qualitative research separating them from criteria such as "internal validity", "external validity", "reliability" and "objectivity" that conventionally apply to quantitative research (p.290-293). Lincoln and Guba's (1985) proposed criteria to establish "trustworthiness" in qualitative research are as follows: credibility, transferability, dependability and confirmability as shown in Table 3.2. These criteria were used to assure and establish the research's validity.

VALIDITY CRITERIA FOR QUANTITATIVE RESEARCH	VALIDITY CRITERIA FOR QUALITATIVE RESEARCH
internal validity	credibility
external validity	transferability
reliability	dependability
objectivity	confirmability

*Table 3.2- Validity Criteria*

### 3.5.1 CREDIBILITY

According to Lincoln and Guba (1985) the implementation of the credibility criterion is a twofold task. Firstly, the researcher has to "carry out the inquiry in such a way that the probability that the finding will be found to be credible is enhanced and, secondly, to demonstrate the credibility of the findings by having them approved by the constructors of the multiple realities being studied" (p.296). In other words, the credibility criterion involves the assessment of the research results that have to sound credible from the participants' point of view.

Lincoln and Guba (1985) suggest the application of five different techniques, which assist in assuring credibility in qualitative research.

*Activities increasing the probability that credible findings will be produced.* This technique consists of three activities: prolonged engagement, persistent observation and triangulation. Prolonged engagement "is the "investment of sufficient time to achieve certain purposes: learning the culture, testing for misinformation introduced by distortions either of the self or of the respondents and building trust" (Lincoln & Guba, 1985: 301). Before the initial stages of the study but also throughout its duration I worked as a demonstrator in one of the courses involved in on-line group learning, where I interviewed lots of students. Therefore, I managed to familiarise myself with the field and also develop some sort of more personal

contact with the interviewees and eventually build their trust in me. The concept of prolonged engagement sounds very close to the concept of theoretical sensitivity, explained in the section dealing with this in the present chapter. The researcher is required to avoid both personal and respondents' distortions. To avoid being a "stranger in a strange land" I tried as a demonstrator to blend with the groups and provide them with help when needed whilst also trying to be friendly with them.

Prolonged engagement also requires the researcher to take into account distortions in the data. Distortions might be personal (dealing with the researcher) or could be introduced by the respondents. To avoid *misconstruction* of the questions I tried to rephrase questions when they were not understood by the respondents, in order to make myself absolutely clear. On the other hand, *situated motive* refers to the cases when the respondent wants to please the investigator either intentionally or unintentionally. Therefore, I tried to make it clear at the beginning of each interview that I was not expecting them to answer my questions in a certain mode, trying to please me because had a model in my mind. I tried to make it clear that I was purely concerned with their personal views.

Finally, prolonged engagement is intended to provide the investigator with an opportunity to build trust (Lincoln & Guba, 1985: 303). Trust building is a developmental process during which the investigator tries to gain the respondents' confidence that their words are not going to be used against them and also that anonymity will be honoured. At the beginning of the interview I made it clear that the respondents' names would not be used and I also tried to make them understand that their responses were going to have an important and valued input in the topic under investigation. I also tried to meet the respondents in the place of their preference although in most of the cases, the interviews took place in university settings where I tried to create a nice, friendly environment where we would be not interrupted.

Moreover, persistent observation adds the dimension of *salience* providing depth to the research. Its purpose is to "identify those characteristics and elements in the situation that are relevant to the problem or issue being pursued and focusing on them in detail" (Lincoln & Guba, 1985: 304). The researchers should be able to sort out irrelevancies, but at the same time s/he should be aware of not coming to a premature closure. The data collection period went through a period of fourteen months with three different periods of data collection followed by analysis. It has to be noted that the use of the ATLAS.ti software assisted a lot, in identifying the most important themes and making them central thereby seeking further exploration of them. This technique is very close to the concept of saturation, which comes from the grounded theory approach. I decided to stop the further collection of data when I reached the point of saturation in each category, when interviewees started to repeat points of view mentioned before by other participants and nothing new was coming out of the data.



Finally, Lincoln and Guba (1985) suggest triangulation as another technique for increasing the probability of credible findings. Triangulation refers to the application of multiple sources of data collection in order to increase credibility. However, it has to be noticed that the technique of the triangulation has not been applied in the present research. The explanation given for such a decision relates to the fact that the researcher attempted to view the world from an interpretivist point of view; present the students' perspectives and attitudes with the aim to understand what happened when students interacted with each other using various types of computer conferencing systems. Therefore, the researcher was seeking to apply pure qualitative methods.

### **3.5.1.1 PEER DEBRIEFING**

Peer debriefing is a “process of exposing oneself to a disinterested peer in a manner paralleling an analytic session and for the purpose of exploring aspects of the inquiry that might otherwise remain only explicit within the inquirer’s mind” (Lincoln & Guba, 1985: 308). The debriefer would play the role of devil's advocate helping the researcher to “test a working hypothesis”, “test the next steps in the emerging methodological design” and clearing the mind of the enquirer of “emotions and feelings that may be clouding good judgement” (Lincoln & Guba, 1985: 308). In our case the role of devil’s advocate was played by my supervisor and a peer student who happened to share an office with me, therefore he was a person who was aware of my topic and had been involved since its initial stages. They both helped me to clarify hypotheses, challenging my points of view and my personal interpretations of the data.

### **3.5.1.2 NEGATIVE CASE ANALYSIS**

Negative case analysis is a process of refining a hypothesis until it “accounts for all known cases without exception” (Lincoln & Guba, 1985: 309). However, it has to be noted here that the present research did not engage in the technique of negative case analysis. The reason why we did not apply such a technique is dual. First, applying qualitative research I was not interested in statistical approaches. On the other hand, the present research did not start with a hypothesis, rather it started with an area of interest and everything that was going to be relevant to this area was allowed to emerge (Strauss & Corbin, 1990).

### **3.5.1.3 REFERENTIAL ADEQUACY**

Referential adequacy refers to the raw data archiving so different analysts can “reach similar conclusions” or “test the validity of the conclusions” (Lincoln & Guba, 1985: 313). In our case all the raw data from the fifty interviews was imported in the ATLAS.ti software which assisted the data analysis. Therefore, raw data existing in electronic form can be easily accessed. However, the referential adequacy technique presents some drawbacks, as it might come to conflict with ethical considerations. Interviewees agreed to be interviewed under the condition that their name was not going to be used. Additionally the material was not going to be used for other purposes than the purposes of the research. Archiving the material and allowing public display would go against the law of confidentiality promised to the research participants.

### **3.5.1.4 MEMBER CHECKING**

Member checking technique involves the checking of the categories and conclusions which arose during the research by the research participants from whom the data was originally collected) in order to establish credibility. The member checking technique was applied at different stages of data collection. For instance, after the first initial coding I checked the results with new interviewees. I asked interviewees to check, confirm or deny the categories developed up to that point. During the process of the next interviews I would always ask interviewees to confirm individual data points referred to by other participants. The final member checking was done towards the end of the project. I contacted people that had been interviewed previously asking them to weigh the meaningfulness of the results and in a way to test their validity discussing whether my interpretation made sense to them and to state if they were satisfied with the six categories around which the data was coded.

## **3.5.2 TRANSFERABILITY**

The criterion of external validity that refers to the generalisation of the results is not really applicable in qualitative research. In qualitative research “we move from a question of generalisability to a question of transferability” (Lincoln & Guba, 1985: 297). “The best advice to give to anyone seeking to make a transfer is to accumulate empirical evidence about contextual similarity; the responsibility of the original investigator ends in providing sufficient descriptive data to make such similarity judgements possible” (Lincoln & Guba, 1985: 298). In other words, the qualitative researcher, being faithful to transferability concepts is required to describe the research sufficiently and to provide a database.

I would argue that the findings of my research could not be generalised to apply to other cases of on-line group dynamics. In other words, the research being described here does not make any claims to statistical generalisation into other disciplines. The expansion of the sample into other disciplines is one of the suggested points for further research. Additionally, having undertaken an inductive analytic approach I had no hypothesis to confirm. Instead I relied on analytic induction, as beginning with the data and exploring it I tried to build elements of a model of the on-line group dynamics. According to Lincoln and Guba (1985) "inductive analysis begins not with theories or hypotheses but with the data themselves, from which theoretical categories and relational propositions may be arrived at by inductive reasoning processes" (p.333).

### **3.5.3 DEPENDABILITY**

"The naturalist sees reliability as part of a larger set of factors that are associated with observed changes. In order to demonstrate what may be taken as a substitute criterion for reliability-*dependability*- the naturalist seeks means for taking into account both factors of instability and factors of phenomenal or design induced change. It can be argued that this naturalist view is broader than the conventional, since it accounts for everything that is normally included in the concept of reliability plus some additional factors" (Lincoln & Guba, 1985: 299). The satisfaction of the dependability criterion can be established by different techniques such as triangulation that, however, requires an inquiry team, and an inquiry audit. Nevertheless, Lincoln and Guba (1985) argue that most importantly the researcher satisfies dependability by examining the "data, findings, interpretations, and recommendations and attests that it is supported by data and it is internally coherent so the bottom liner can be accepted" (p.318). The latter is a process which also helps to establish confirmability. This criterion has been satisfied by the present research as all results have been supported by data quotations in every case (see result chapters).

### **3.5.4 CONFIRMABILITY**

Confirmability removes the emphasis on objectivity from the investigator to the data itself. The issue is no longer the investigator's characteristics but the characteristics of the data: Are they or are they not *confirmable*? The naturalist prefers this concept to that of objectivity" (Lincoln & Guba, 1985: 300). As was explained before, the support of all the interpretations made in the research with data is a technique that was used in addressing issues of both dependability and confirmability.

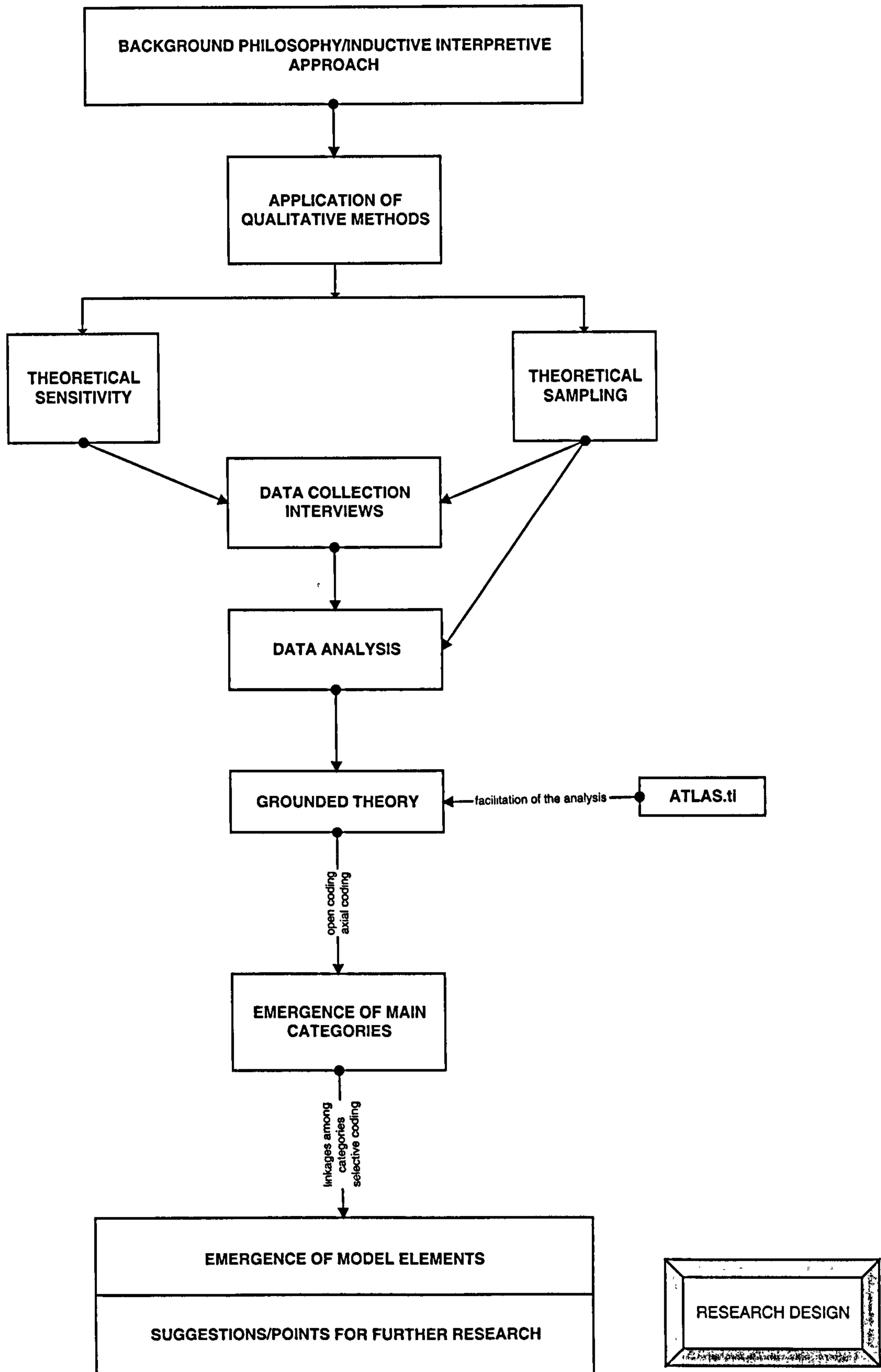
Finally, as has been suggested by Lincoln and Guba (1985) all the concepts (see Figure 3.9) described as techniques for establishing trustworthiness can also be assisted by the creation of a reflective journal. By keeping a reflective journal the researcher records a variety of information such as daily scheduling, personal diary events for reflection, methodological issues and decisions. The reflective journal was kept throughout the process of the research and it has been archived in the ATLAS.ti software in the form of memos.

<b>Summary of Techniques of Establishing Trustworthiness</b>	
<i>Criterion Area</i>	<i>Technique</i>
<i>Credibility</i>	(1) activities in the field that increase the probability of high credibility a) prolonged engagement b) persistent observation c) triangulation (2) peer debriefing (3) negative case analysis (4) referential adequacy (5) member checks
<i>Transferability</i>	(6) thick description
<i>Dependability</i>	(7a) the dependability audit
<i>Confirmability</i>	(7b) the confirmability audit
<i>All of the above</i>	(8) the reflective journal

Figure 3.9- Summary of Techniques of Establishing Trustworthiness: Lincoln & Guba, 1985: 328

Based on all the above the research design and implementation undertook the following steps (see following Figure 3.10)

The presentation of the results will follow in the next Chapters 4-8. The figures used were created in ATLAS.ti software and represent codes and links among the codes along with their identified relationships, such as causes, contextual and intervening conditions, action strategies and consequences. The signs used at the beginning of each code name were set by default by the software developers to represent number of links and attached quotations.



*Figure 3.10- Research Design*

# **CHAPTER 4:**

## **RESULTS**

### **ISSUES OF EXPRESSION**

#### **IN COMPUTER**

#### **CONFERENCING**

# 4. EXPRESSION IN GROUP COMPUTER CONFERENCING

## 4.1 EXPRESSION: CONTEXT

As has been described earlier, the contextual conditions are a set of properties pertaining to a particular phenomenon. A closer look at the phenomenon under description, that is, in this case, the way group participants expressed themselves in the on-line group, revealed a number of contextual conditions as shown in Figure 4.1.

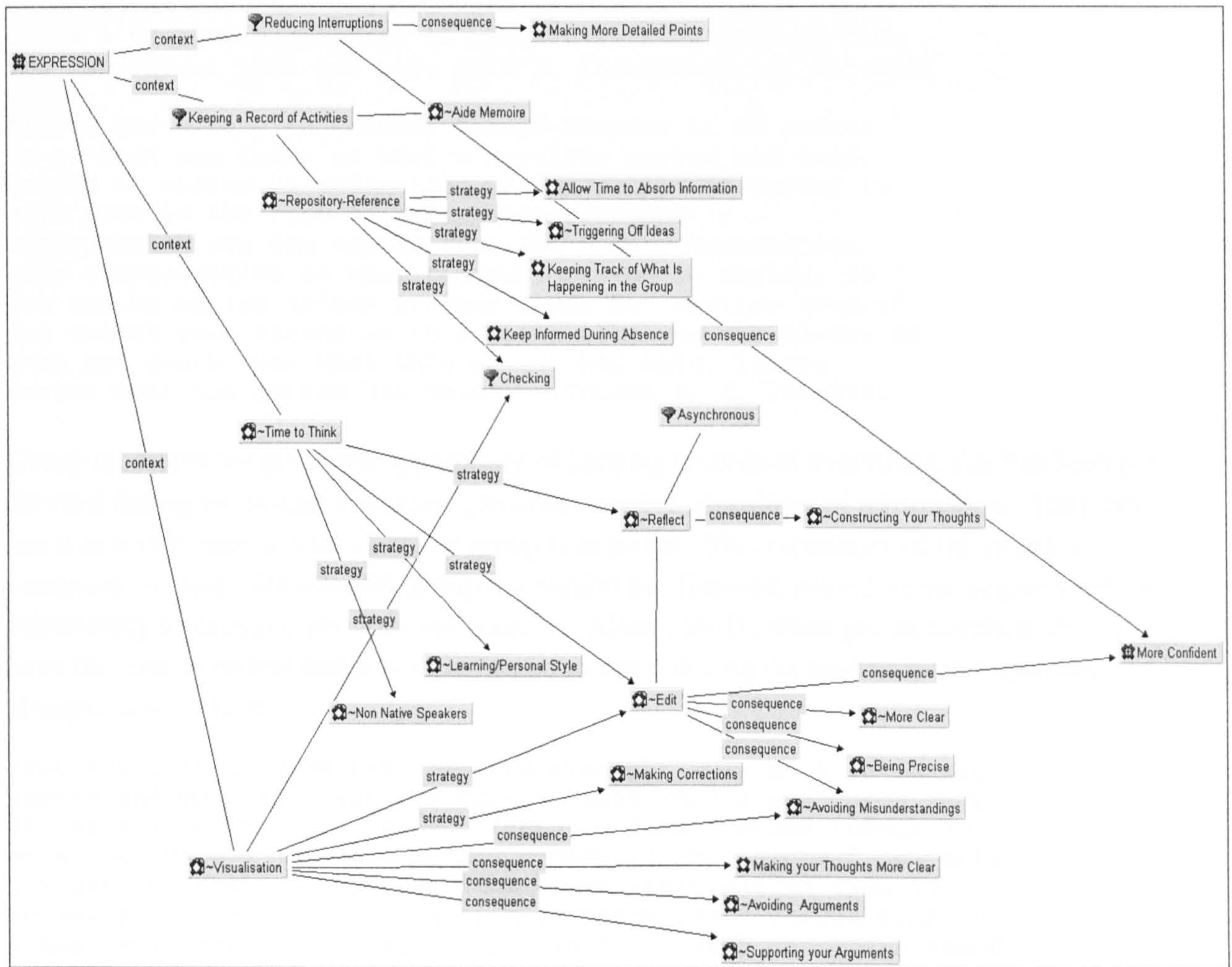


Figure 4.1- Expression- Contextual Conditions

### 4.1.1 KEEPING A RECORD OF ACTIVITIES

As reported by the interviewees, one of the most important advantages of on-line group communication is the opportunity given to the group members to keep records of all the ideas expressed during their on-line interaction. It seems that group members tried to take

advantage of this function in many ways.

Firstly interviewees reported utilising this specific function, provided by the environment, as a memory assistant. Since every group members' contribution is located and kept under the specific software in use, group members cannot forget or pretend to forget group matters unless they wish to.

"I think that everybody is a lot more inclined to make a contribution when they want to, that it will be the element of people being frightened to speak up and there is a better chance to look up and understand what everybody else is doing rather just being told by them, you can go through their work electronically, there is a record of what is being going on, that you are keeping through your e-mails or in a newsgroup. Whereas if you are working face-to-face you can forget that you have said". (Interview 16, 119:124)

"It is quite easy to control things because it is easier to go back and think of what a specific person had said, and it is easier to understand what a person is trying to say. Even in the face-to-face where everyone is contributing you can easily lose the point, because you keep concentrating on what the next person is saying, so you end up mixing things in your mind. But on-line even if you switch your attention to someone else you can always go back and check upon what this person has said, if you forget what the person has said". (Interview 3, 368:374)

Group members are given the opportunity of keeping records of everything that has been put forward during an on-line interaction, in other words a repository of information. They can use it as a reference at later stages of group interaction. This repository of information continues to exist even after the group interaction has finished, providing participants with the opportunity to examine previous information. Alternatively, when group members do not have the time to reflect and absorb information given during the on-line interaction they can always access it later.

"You are putting down the comments straight away as a permanent record and you can always go back to this record and check what it was said whereas in face-to-face you just discuss things lot more but you are not necessarily coming on the information. Well you get information but sometimes there isn't enough time to actually show all the information or there isn't enough time to actually absorb it, you actually have to go away and think about it". (Interview 28, 386:394)

By having this record of activities group members can always keep track of everything that has been said. Consequently, they can always return rejoining a conversation.

"So, using a conference system the conversation is already there, it is already worked out and you can go back to it, look at it, see what has been brought up if you want to work on it on a later stage. I mean it all there, it is already done, it is not happening in the face-to-face interaction,



it is difficult to say wait go back to your mind and remember what happened that day". (Interview 09, 145:150)

Group members can also utilise this repository of information at a later stage to trigger off ideas, when they are lacking inspiration.

"I mean on-line you can type out what you are thinking, and it is nice to know that someone else is reading it, thinking about it and also responding immediately and you have a record and so you can always use it to trigger off other ideas, people might say I wrote this or give references. I mean you could do that face-to-face too, but I actually found that if it was on-line and people would react that way it would motivate me". (Interview 11, 380:392)

Even if a group member has been away for some time he/she can always be updated and informed of what has happened in the group during their absence.

"I mean it is up there for the record, you can always check upon it, but it really depends on the content. But then, I think that you probably consciously or unconsciously sense that any way, if you really didn't want something to come out you would not put it out there". (Interview 28, 127:130)

It seems that some interviewees enjoyed this facility and others did not, fearing that they would not be able to withdraw whatever they had stated in the past. However, in general terms, keeping a record of group activities helped participants to remember and reflect on their previous contributions in the group. It seems that the Latin saying "Verba Volant, Scripta Manent", that in free translation means "Words are fleeting but writings persist", could be very applicable in such cases.

#### **4.1.2. INTERRUPTIONS**

Interviewees often reported being interrupted by their peers during their face-to-face group interactions. This was criticised by the interviewees and considered a major disadvantage of the face-to-face group communication. Getting interrupted before finishing developing an argument or making a statement seemed to have annoyed group participants trying to make a point. Actually, interruptions could be so disappointing that they could even make certain group participants stop participating, making comments and expressing their views.

"I can be shut down quite badly actually so sometimes I just don't speak, it does go really difficult when you are trying to make a comment and someone says something, or when you are half way through making an argument people just interrupt you to disagree with you when you haven't finished your point". (Interview 23, 332:336)

During the face-to-face interaction, certain group members seemed to be particularly annoyed about dominant group participants who were very outspoken and always attempted to object to everyone else's point of view.

"I mean I do feel I am a bit interrupted. It's not necessarily that they're being more people who are more dominant, and there's quite a few people in our course anyway who are fairly outspoken, and not being one person's group who I wouldn't really have said was very, not so much dominant, but very visible in terms of the way he talks and the way he always gets up and quite often tries to bring up objections to those points. So, I think it's partly not being with those group members and I mean I'm not particularly shy about what I think". (Interview 48, 184:191)

Having to face such problems in face-to-face situations, interviewees admitted that the on-line environment discouraged interruptions, and prevented dominant people from interrupting their peers. Additionally, they admitted being offered the opportunity to elaborate on their points of view, participate more, and contribute in the group without being interrupted. It was actually up to the group members to take their time, compose their contribution without being interrupted and then send their contribution just by pressing "enter".

"When I am expressing my opinion in the on-line environment I just type whatever I want to say, there are no interruptions, I will finish speaking when I will decide to do so, I will finish when I will put a full-stop at my sentence, there will be no interruptions from other members of the group, so I am more able to say what I want to say and not be interrupted by anyone, because when you are interrupted you actually lose what you want to say". (Interview 40, 80:85)

Interviewees also reported that diminished interruptions in the on-line group helped them feeling more comfortable, and in a way built up their confidence.

"I feel a lot more confident because I can make a point without being interrupted, which is something I cannot really stand". (Interview 23, 326:327)

Additionally, they managed to elaborate on their points making them more detailed and intelligent, eventually enhancing their contribution.

"Advantages, you can be a lot more confident about what you are saying for a start, because you don't have the presence of a dominant personality and you can make a more detailed point without being interrupted all the time, and you can record your comments and double check on them, and find out what other people would say". (Interview 23, 449:455)

"At least this way you can actually finish your point and get it across, and if you come a point you can make it a bit more intelligently". (Interview 23, 333:336)

### 4.1.3 TIME TO THINK

Evidence from the interviews showed that one of the greatest advantages of the on-line environment (and especially its asynchronous mode) is that offered its users more time to think about their on-line contribution, to reflect on it, to edit it and then to send it. The *Time to Think* code is closely connected to the *Edit* code. During on-line interactions group participants are provided with the "luxury" of spending more time to thinking about their contributions. So, they will edit their input in order to make it more presentable and comprehensible. As a result, group members would feel much more confident with their input, and their contribution will become more precise and clear to their peers. It is in fact, the on-line environment that is actually providing them with this freedom. Since, they can pause, compose their sentences, make any necessary changes, and edit their contribution before they eventually send it. The reason why group participants acted in this manner relates to the fact that they want to make absolutely sure that their words reflected their intentions, preventing ambiguity and misinterpretation, and finally establishing sense making. Interviewees supported the argument that the on-line environment provided them with the opportunity to take the time they needed to think and *reflect* on their contribution before sending it.

"I mean everybody is quite friendly with everybody else on-line, it is easier because when somebody says something to you sometimes in face-to-face you tend to go just "yes I know" because you haven't really thought about it but on-line it is at least on the screen so you have time to think about it before you write your response back, so it gives you that little more thinking time. When you speak it is quite spontaneous if you are in a face-to-face conversation because you just tend to say whatever comes to your mouth you don't necessarily think yes that maybe I really good idea because of this and this". (Interview 17, 350:357)

They also commented on the fact that the asynchronous mode of communication provided them with more opportunities to reflect on their contribution. As the asynchronous mode does not require an immediate response, extra reflection time is given to the group participants. As a result the group members were able to construct their thoughts in a more creative manner.

"I prefer talking to people face to face generally, but that being said, people can think their ideas through when they are working on line. Obviously, if you're doing like a real time chat like IRC, then that's more like the concession we are having right now. But if you're using e-mail or bulletin board, people will take 10 or 15 minutes to maybe think through a message and go back and edit it until it's perfect, then they will hand it to you and what you're getting is more structured thought. So, when it comes to your end you can see that they've actually throughout that message quite clearly and that's really what they want to tell you". (Interview 25, 82:89)

The comparison with face-to-face group interaction was almost inevitable. Face-to-face interaction requires an immediate response to other people's comments. However, that is not the case with on-line communication, where group members can think of their contribution for some time before sending it.

"Yes, I do express myself in a different manner on-line, what I do is that I am writing a sentence and then I think of it for three times before I send it, but when you are face-to-face you just say something, you do not have time to think about what you are saying. But when you have the actual sentence in front of you can make any corrections you like before you send it, you can even delete some thing if you believe that they are not relevant to what you really want to say". (Interview 39, 129:134)

Subsequently, after the reflection time, the next step in the forthcoming contribution would be the editing. Group members not only had the time to think about their input before sending it, they also had the time to edit it, making the necessary changes and assuring themselves that they would not be misinterpreted.

"I think the more I use it the more I learn to express myself more clearly using on-line facilities. I mean if you want to say something and come as you want it, something might be missed out, and I think that people might take it the wrong way. If you try to say something quickly and type it like that it makes it more difficult the other person to take as you meant it. And I think it is important to take the time and make sure what you said looks the way you wanted to be said, then send the message or whatever. I think that I've learnt to do after having experience where someone took me the wrong way". (Interview 09, 163:170)

As a result of the time allowance to think, reflect and edit in the on-line group situation, group members became *more precise* on their writing.

"I would say that sometimes you are more precise when you are writing on-line because you can think about it more as you are writing it, you can change it a little bit and then send it". (Interview 05, 117:121)

By being precise they manage to express themselves in a *clearer manner*.

"Sometimes when I am saying something, I don't really think what I am saying I am just saying it when I am face-to-face or I cannot get the right word, but things are different when I am on-line I am more able to say what I want to say and express myself more clearly, make proper sentences and make statements to my group members. The fact that everything is written on the screen is helping you a lot to analyse what you want to say. On the other hand, being on-line is giving more time to think about what I want to say, I can check something before I send it away". (Interview 39, 100:107)

"The advantages are that the on-line group is giving me

the opportunity to think about what I want to say, because it is there, it is on the screen so even if I have a language problem, I will still be able to take my time and express myself more clearly". (Interview 40, 438:440)

Therefore, time allowance, the fact that group members could edit their input before sending it, and the expression of their thoughts in a clear manner helped them build up their confidence, and *enhanced their self-esteem*.

"Sometimes you just find yourself just writing long e-mails and say your opinions then you stop yourself and you think what are they going to think when they are going to read this and this is absolutely what you want to be saying. So, generally I feel more confident". (Interview 16, 351:356)

"My self-esteem was OK when I was using the on-line environment, I had a language problem, but it wasn't a big problem, you express your opinion and you get a response and then you have the time to think and make your answer". (Interview 22, 474:478)

On the other hand, the time allowance provided by the on-line environment was reported to particularly suit *non-native speakers* of English. Additionally, in some cases the time allowance was found to suit group members' personal learning styles. It seems that people who needed an enhancement of their self-esteem were the ones who they were not native speakers of English. Due to language barriers these participants reported requiring more time to think and compose their sentences and contributions. The on-line environment provided them with this opportunity. When non-native students faced problems caused by their language use, they took their time to compose their contribution at their own pace.

"I think it must help different people from different backgrounds to come together because I've noticed with other group projects when I am in the Business School, there are foreign students there, they keep quiet whereas native speakers they automatically take over, and it is not that the foreign students they don't know what they mean or just they don't have the confidence to express themselves, but they must find it really difficult to have to cope in a foreign country and try to make themselves known using a second language, I really think it is difficult for them. And working on-line must be so much easier for them because as I said before they can say what they want to say, think about it before they express themselves and just get their point across like anybody else. So, I am sure that using on-line in these sort of cases it is a good idea". (Interview 04, 280:289)

"I suppose my group mate, he's got very good command of the English language and I guess the things that he was clarifying were really quite technical issues to do with like designing a data base. And I guess in person he can also explain to me by drawing diagrams, by saying things. I mean there's a real variety of different methods he can

use to get the message across to me so I could understand you know, exactly what he wanted us to do. However, I guess from the other point of view if he wasn't so good at English or he was just good at English but I wasn't then e-mail would be an easier way because then you do have the time to sort of write, and the time to think about the words and the time to think about what someone has written to you. So that was certainly evident in the group work with the Greek students for example and the Portuguese students. At first we used real time chat but it wasn't going anywhere, you know it was just the English people talking to the English people because I think we were going too fast and the phrases, and the English people weren't really thinking, you know, so and so might not understand what that phrase means". (Interview 47, 207:219)

Another interesting code was identified among the quotations belonging to the *Time to Think* code. Interviewees mentioned their preferences based on their *Personal Learning Styles*. The next interviewee seems to make a distinction between people who prefer to take their time to think before expressing themselves and other who are more able to express themselves directly (think and write at the same time). The time given for reflection by the on-line environment seemed to particularly suit the following interviewee.

"There are other people who prefer to think first, like I do, and then express themselves, these people they want to have a more clear idea of what they are going to say and then express it. But there are other people who would like to make a point and then change it, make another point and think and write at the same time. Me personally, I just like to think of something first gain a clear idea about it and then talk about it". (Interview 39, 179:194)

The next quotation is unique and therefore quite an interesting one, as the interviewee reports suffering from dyslexia. She reports that, as she is unable to cope with lots of information at once in face-to-face situation, she found it particularly helpful to communicate on-line, in an asynchronous mode. The fact that everything was written, and could be kept written, on the computer screen gave her time to reflect on it at a later stage which seemed to work particularly well for this interviewee. The *Time to Think* factor worked as a relief to her anxiety and allowed her at the same time to use her sense of humour.

"I find it easier the most of the times to communicate on-line, because again the way my head works, I find it difficult if I am in a group with people, this is part of the dyslexia, I find it hard when a lot of information is coming in at once, and if I don't know people very well I am taking down information About who they are, what they do, it is always about individual people, and if they start shouting questions at me I cannot take that much in. When we were using the newsgroups and I edited out all that extra information, which I find hard to process, so when I came around I had extra time to actually think about what they were saying, so that was good. And also I think it is more amusing, because I find it so hard to take all this information, leaving it alone I am quite anxious how it is going to come out, it comes out rather

boring because I don't have that extra time to make it more interesting. But when you are typing, you know, I am quite humorous on the Internet and on the e-mail, but I am not usually, because I just can be more informal and chatty and just you know, when you are writing an address on the e-mail and you have a little subject there I always write something humorous, you know something like that, I can get more informal that way with people I don't know". (Interview 02, 209:226)

#### 4.1.4 VISUALISATION

The code named *Visualisation* refers mainly to the fact that the on-line environment helped group participants to see what they had written on the screen, edit their contributions and then make stronger arguments. There is close connection among the codes of *Time to Think*, *Keeping A Record of Activities* and *Visualisation*. Usually these codes appeared together under the same quotation. *Visualisation* seemed to have assisted group participants to gain a more crystallised idea of their writing, eventually making their *thoughts clearer*.

"OK, let's talk about people I do know when I IRC with them it is very spontaneous especially if I know them very well, you just type down what you think, because I am quite good in typing so I can just type as it comes and I like seeing the words on-line actually, it is like making your thoughts more clear, it is like actually visualising it on screen which is what it is". (Interview 11, 165:169)

"Sometimes when I am saying something, I don't really think what I am saying I am just saying when I am face-to-face or I cannot get the right word, but things are different when I am on-line I am more able to say what I want to say and express myself more clearly, make proper sentences and make statements to my group members. The fact that everything is written on the screen is helping you a lot to analyse what you want to say. On the other hand, being on-line is giving more time to think about what I want to say, I can check something before I send it away". (Interview 39, 99:107)

Once again, interviewees admitted that being on-line and having all the information they needed written on the computer screen helped them to stand back, analyse what they wanted to say and then compose and *edit* their input. The next quotations reveal how this happened in combination with the extra time given to the group members.

"What you want to say, the message is written on the screen, before you send a message you can read what you have written, all you have to say is there and you can edit it before you send it, so I do not think that this can cause any misunderstandings". (Interview 40, 316:320)

"I think it makes you think more about what you're actually saying because once you've actually physically written it you can see what you're going to say and unless it's actually kind of direct sending, you've actually got

to make sentences, so you tend to actually read it again before you send it which you tend to make sure your message is exactly what you want to say. Because once you've sent it, you can't see how the other person's reacting to it. You can't see what their instant response is to what you're saying, whereas in face-to-face if they're misunderstanding your message you can actually interact and use your kind of body language and actually re-explain it. Whereas when you actually send it through e-mails you don't know when they're going to read it, whether it's instant, how they're going to react and you can't actually automatically re-explain what you're trying to say". (Interview 36, 139:148)

Part of the editing procedures applied by the group participants with the intention to prevent any possible misinterpretation of their writings was *corrections* made purposely, so everything written on the screen would make sense.

"If you haven't met someone before you should write more words and try to make everything really clear and quite formed and if you've got a thing on the screen in front of you then basically that's what helps you do it. You can go back over it, you can read the first part again to see if it makes sense, if the text flows, to really make sure that if you read it, it looks clear and then you go back and edit it again. And that's certainly true especially I suppose if there's a language barrier in the way, English isn't your first language for example. Well even the other way round, you know, when you're talking to somebody who you know, might not have particularly good reading skills but it helps both people to try and just clarify exactly what they're saying. A lot of times when you write an e-mail, even if it's to a friend actually, you'll write it very quickly but you might just quickly scan over it just to make sure it's OK. And I guess what you are doing is you're trying to make sure you are not repeating yourself and you know they understand exactly what you're saying whether it's a joke or whether it's a ... a discussion of some sort you know". (Interview 47, 119:135)

Additionally, having everything written on the screen and being able to access it at any time, meant that group members were also able to use this facility to *support* and *strengthen* their *arguments*.

"Some people they just say it is easier because they can always go back and check whatever they want to, whatever they said or other people said. It is good because then you can actually strengthen your arguments, your arguments they are written, you can avoid by that a really messy situation, in fact you can see what was said in the past". (Interview 23, 435:445)

"It depends what you've written I suppose, I think it could get you into trouble, but then at the same time say with a meeting with my tutor, if I wrote down, say, a reason why I wasn't there or something like that, if it's written down



then it's always there for you to go and see and have a look at. Whereas if you've said something to somebody and you can't remember quite how you said it or quite what you asked for or something like that then I suppose if it's written down, you can always go back to it and have a look to support your arguments". (Interview 41, 176:184)

As a result group members managed to *avoid* any possible *arguments*.

"But on-line I believe that can more easily avoid arguing because everything is on-line, it is there on the screen, you can read and understand what everyone is saying. In my group there are only four members so I can analyse my own opinion and the opinions of my group mates, then instead of arguing you just express what you want to say, you take the points of view of other people and based of those you make your points. It has to do with the fact that everything is written on the screen and everyone can check upon what the others are saying. There is another thing also that you can actually keep a record of what everyone has said for further reference". (Interview 39, 286:294)

If group members took advantage of the time allowance to edit their messages and the visibility of their peers' contributions they could, up to a point, avoid arguments with their peers.

"I do not think because what you want to say the message is written on the screen, before you send a message you can read what you have written, all you have to say is there and you can edit it before you send it, so I do not think that this can cause any misunderstandings". (Interview 40, 316:320)

## 4.2 EXPRESSION: INTERVENING CONDITIONS

One of the conditions found to intervene with the process of expressing oneself in the on-line group was the code *Language Competence* or *Writing Skills*. Interviewees reported a difference between written and oral form of language communication. If the written form represents the on-line group communication, and the oral form represents the face-to-face communication then being able to handle a fair level of the written form of the language, when on-line, is of vital importance.

*"Do you believe then that you would need to have good writing skills?"*

I think you would because if you didn't have you'd just confuse the other people you're trying to talk to. So you've got to be able to express yourself properly.

*So, do you find that you express yourself differently on-line than face-to-face?"*

I don't exactly think differently, I seem to say the same things, but I think when I'm in a group I've got a bit more presence. I mean, I suppose it sounds a bit mean but you can

sort of talk them into it whereas when you're on the computer you can't if they don't want to listen to you that's fine". (Interview 44, 83:93)

"I think in face-to-face I feel quite confident because I'm usually quite good at group work and telling people what I think and always straight to the point, I'm not scared of saying things. Whereas when I'm on e-mail I don't seem to have as much presence. I know that sounds really bad as if I'm manipulating people when I see them but I don't mean it like that. But the thing's, my written skills I don't think are quite as good as my verbal skills". (Interview 44, 213:219)

Two different types of language users were identified during the study namely *native* and *not native speakers*. Interviewees coming from other countries to study in UK reported a difficulty in handling the English language, commenting that they needed more time to think before composing a sentence.

"You cannot express yourself that easily, I mean, some people can. Like in my group I see that some people are more freely than they are taking on-line, and some people are, they do not have enough freedom when they are face-to-face. For me, I think I am more able to express myself when I am in face-to-face than on-line. This might be because of my language, English is not my first language so it maybe partly because of that. Sometimes, when I am writing I have to think of "oh, what I am writing", I cannot make a sentence". (Interview 06, 199:206)

The time allowance worked positively for foreign students, as they had the time to think and edit before composing.

"I think it must help different people from different backgrounds to come together because I've noticed with other group projects when I am in the Business School, there are foreign students there, they keep quit. Whereas native speakers they automatically take over, and it is not that the foreign students they don't know what they mean or just they don't have the confidence to express themselves. But they must find it really difficult to have to cope in a foreign country and try to make themselves known using a second language, I really think it is difficult for them. And working on-line must be so much easier for them because as I said before they can say what they want to say, think about it before they express themselves and just get their point across like anybody else. So, I am sure that using on-line in these sort of cases it is a good idea". (Interview 04, 280:289)

Additionally, the written form of communication, as lacking difficulties that might be created by different accents, make it easier for the non-native speakers to express themselves.

"In written form yes, the oral form would be a bit difficult

because of the different accent people have and you have to pick up. It is not only that you try to figure out what they are, you have to figure out what people are saying, if people have as a mother tongue some other language and not English then their sentences are put in a very funny way. If it is in written form it is easier to understand what people are trying to say". (Interview 24,395:399)

## 4.3 EXPRESSION: ACTION/ INTERACTION STRATEGIES

### 4.3.1 FREEDOM

Interviewees reported finding it easier to communicate with their peers on-line. The ease of communication was linked to the freedom provided by the use of computer-mediated communication. The *absence of direct interaction* among the group members provided them with the opportunity to express themselves in a more free and careless manner.

"I think it comes out of the free business again because again when you are on the Internet you can talk to everyone that they want to talk whereas when it comes back to face-to-face you feel should I talk to this person or should I don't. In the CMC the persons are different because everybody else talks freely you talk freely, you build a relationship up with the group you are in and you are enjoying yourself doing it". (Interview 03, 133:138)

"Yes, everything comes out to being free again in the on-line environment because seriously you can type away everything you want in an on-line environment because the persons are not near you and they won't come around and slap you or something, so you are not scared or anything and you actually do type whatever you want because it doesn't bother you basically. But with face-to-face before you actually say something you think about it about 15 to 20 times in your head if you do something or say something". (Interview 03, 171:176)

### 4.3.2 OPENNESS

In connection with the previous code, interviewees also reported expressing themselves more openly when they were on-line. They seemed to feel *more comfortable* about *disagreeing* with their peers, therefore they were more able to put their opinions forward.

"Personally, I think I am more open on-line and more likely to say what I feel, I am not going to extremes but yes I would be more likely to say no I disagree with that than I probably would do face-to-face or at least if I did it face-

to-face I would say in a roundabout way or in a certain manner, but I am not so concerned being myself on-line". (Interview 18, 118:125)

The reasons explaining such attitudes deal with the *lack of direct interaction* and the security of *anonymity* the on-line environment offers.

"Do you find a different way to approach people on-line? I could be more open, I just can say hi, what is your name and you don't have to face someone". (Interview 23, 89:92)

"Do you find that you express yourself on a different manner when you are on-line and face-to-face? Yes, I am more open maybe. Why do you think this is happening? It goes back to the anonymity thing again, I suppose. (Interview 27, 111:118)

Additionally, a closer look at the quotations linked with the code revealed that group members who defined themselves as *shy* were more likely to express their opinion on-line and therefore became *more open*.

"But you also get people whom you are trying to make talk and they don't want to sometimes. And these people are more open on-line". (Interview 21, 139:144)

"I think you do, I think it is a lot different because when you are on-line perhaps you would talk about things you wouldn't say face-to-face, because you don't have to see them face-to-face. If you say you shy for example you can sort of start writing about things rather than try to bring up the conversation and say who is going to do what, you just say who is going to do what, type it in and then you can wait for your response". (Interview 10, 88:92)

### 4.3.3 HONESTY

Because they were more free and open in their communication, group participants managed to become more informal and were therefore more honest. Interviewees admitted expressing themselves in a more *straightforward manner*, as they were more likely to disagree with their peers. It is interesting to note in the following quotation the comparison with the face-to-face situations where group members felt they expressed themselves in a more *roundabout way*.

"Personally I think I am more open on-line and more likely to say what I feel, I am not going to extremes but yes I would be more likely to say no I disagree with that than I probably would do face-to-face or at least if I did it face-to-face, I would say in a roundabout way or in a certain manner, but I am not so concerned being myself on-line". (Interview 18, 118:125)

"But when it is on-line I have no idea if they like what I am saying or not I just am honest and I say what I want to say, sometimes what I am saying it might hurt other people but I am in no position to know that, and that is quite different". (Interview 26, 107:112)

The explanation of the reasons why group members felt comfortable being honest with their peers deals with the *lack of immediate feedback* due to the existence of the on-line environment. The text-based nature of computer conferencing communication results in the lack of immediate consequences of someone's words that eventually promotes *honesty*.

"I think people can be a bit more honest because you don't get as much instantaneous feedback which then makes you change your mind or qualify what you have acted, what you were saying so you actually finish your thoughts because it's text based rather than orally based. So, you actually finish your paragraph whereas if you're getting a continual feedback, face-to-face, if you see that you're getting an unexpected reaction to what you're saying then I think, unless you're very thick skinned or very opinionated I think there's a possibility that people would then alter the way they say it so it doesn't come across as maybe as forceful or you know as controversial". (Interview 48, 54:64)

However, being honest with their peers might mean that group members would become rude?

"Yes, because you can type things that you wouldn't normally say so if someone was annoying you you'd type shove but if you were face to face you would never say that". (Interview 34, 121:122)

#### **4.3.4 FORMALITY**

In general terms, interviewees reported feeling more comfortable in the on-line group, therefore they managed to express themselves in a more informal way.

The reasons explaining such attitudes deal once again with the fact that group members worked using on-line environments. Due to the emotional detachment the on-line environment offered, group members were *more relaxed* at their group communication, which therefore became *more informal*.

"Yes, I can see where it is coming from, it is coming from the fact you could be somewhere, anywhere and the other person could be where they want to be and this way makes you very informal, very relaxed and I think it works a lot quicker that way. Also personally, I do like the sort of face-to-face communication, you can get good ideas more easier but at the same time I like the sort of the mystique especially when you speak to someone you don't know on-line and you can have a much more easier conversation on-line

than you could face-to-face, it think it helps if you work in a group on-line". (Interview 09, 105:111)

"Yes, I think I probably do actually, I think usually when you are meeting someone for the first time you are quite shy, you want to know a little bit better that person, or at least this is the way that I am. But communicating on-line I can be sort of like maybe a little bit tricky, not formal enough. Whereas, when you are face-to-face if the persons they don't understand they have to respond straight away. So, I think personally that first time you have to communicate on-line it is more relaxed and more sort of easier to talk". (Interview 09, 116:121)

However, interviewees admitted having to be formal during their interaction. A closer look at these cases revealed a number of conditions effecting and causing formality. Interviewees reported feeling that they had to use more formal ways of writing because they wanted to *avoid being offensive* to their peers.

"Yes, because as I said in the group it is more formal because you don't want to offend anyone so I am more careful about what I type, it is restricted to work. Having said that it is because you actually meet the people And you are working with them, when I share IRC with people Who I don't know and I won't likely meet then you tend to, well I don't know. OK, let's talk about people I do know when I IRC with them it is very spontaneous especially if I know them very well, you just type down what you think". (Interview 11, 161:169)

Additionally, interviewees admitted using a more formal way of writing when they were communicating with group members they *did not know* or with whom they did not have an established relationship. In other words, group composition affected the level of formality in the group.

"On the other hand, when I am on-line I express myself in a more formal way, not when I am chatting to my friends of course then I am expressing myself as I always do, I am more formal when I am with my group members, not jokes are allowed. It is a group project so I have to be serious about it". (Interview 39, 132:137)

"I would definitely use a more formal way of writing, of course if is a group where everyone is friends with the others then it doesn't have to be very formal". (Interview 40, 126:129)

Another group of people feeling that they had to use language in a more formal way were international students, the *non-native speakers* of the English language. Interviewees seemed to comment that when English was not their mother tongue they expressed themselves in a more formal way. Non-native students only know how to express themselves in a formal way, as this is the way they learnt to express themselves in English.

"When I am on-line, the conversation will be more formal I guess because I am a foreign student when I type my English is more academic I guess, it is more a formal writing". (Interview 40, 113:117)

### 4.3.5 POLITENESS

Politeness was found to be mainly a characteristic of the face-to-face interaction. Interviewees did not provide us with data allowing us to connect politeness with the on-line group interaction. However, data contained information on the reasons explaining why the on-line group interaction did not concentrate much on politeness. Interviewees commented that they did not have to focus on being liked by their peers when they were on-line. In other words, they did not feel that they had to concentrate on interacting and socialising with them. It seemed that they considered the on-line environment more *work orientated*, where space for social interaction and therefore politeness was limited.

"In the group you have to bear in mind what everyone is as individual but in the group it was not a major issue because we had a good group, we all got on well. It would be interesting to find out if we got on well because we did lots of work on-line. When you are doing work on-line you just get straight down to it, there is no little pleasantries, polite conversation, you just get on with it straight away on-line which is good". (Interview 21, 319:323)

"Yes - there's maybe a lot less messing around. Well, when I see someone face to face for the first time you are quite interested to find out what they're doing, who they are, if they're happy or if they're sad. On the Web Board you might out of politeness, on the first message say, Hi, we're from England bla bla bla, hope the weather's great over there, this is the project that we have to do. And get straight into it. I guess you don't waste words so much". (Interview 25, 105:110)

On the other hand, politeness was mentioned as part of the on-line group interaction, which was affected by certain intervening conditions. For instance, group members felt that they would try to be very polite when they *did not know* the other members of the group before started interacting with them, or they had not established any kind of relationship with them.

"But I mean I'd be polite anyway face-to-face. But also I mean it's not so polite, you can be to the point as well. You don't have to keep battling about all these you know like manners and what have you with all the yours sincerely that you would in a formal letter. You can still keep it to the point. But you've got to be polite as in you don't know who the person is and you don't know if they're going to be offended by what you're saying". (Interview 44, 157:163)

### 4.3.6 BEING CAREFUL

Furthermore, interviewees reported feeling that they had to be "careful", "cautious", and "precise" of what they were saying, of the way they expressed themselves, during the on-line group interaction. The reason why group participants felt they had to act in such a manner relates to the absence of use of facial expressions and body language. Certain gestures cannot be used to support someone's words therefore there is a higher chance of being *misunderstood*.

"We had it online basically, particularly between myself and Carlos, Gratsi and Adelia - there was quite a good spirit. I think it's a lot harder to do online this kind of thing, but the kind of groups, face to face groups, and it's much, much easier, because you can talk about things, you can laugh at things, there's emotions you can convey that you really can't do online certainly not yet. Maybe in a video conference you might be able to. The simple hand gestures, even if you're trying to forcefully put an idea forward, if you did it by e-mail or Web Board it might be seen as being aggressive so you have to be quite careful. Whereas if you did it in a meeting sense, you might be able to convey it but then smile at the end of something and say, you know". (Interview 25, 373:381)

"Also you don't have the facial expressions - I don't think it can be as expressive. You have to be careful as well of what you're saying. Well, you can say so much with just the nod of your head but like when you're typing away, what you're typing may suggest what you don't necessarily mean. A person can take offence to something you just didn't mean him to take offence by". (Interview 35, 119:124)

Due to the lack of social and communication cues which can possibly cause *misunderstandings*, group members reported feeling the need to be careful, wishing to *avoid sounding aggressive* to their peers.

"That's essential definitely because you have to convey just in case people might get the wrong idea and also people might be different when they are on writing you know they might sound aggressive or you know they might sound threatening or something when they are writing and then you meet them face to face you realise that they are not the type of person on-line, it's funny thing. Some people have a different way of actually writing down things, like for instance in general with me people get the wrong impression with what I say even face-to-face I might sound maybe sometimes more aggressive and I don't mean to be like that, I am not thinking like that, it's the way people interpret, Even face-to-face that can happen". (Interview 38, 143:151)

Additionally, group participants were also aware of the fact that the on-line interaction could cause misinterpretation and, because they wanted *to avoid sounding offensive* to the rest of their group members, they paid extra attention to the way they were phrasing their sentences.



"Er, yes you have to think well before you actually write something, how it's going to be perceived by the person who's reading it. There's a lack of like, er, body language so you have to either spell things out really clearly when you're talking to somebody or try not to say things that might offend people in some ways because it can be taken the wrong way". (Interview 30, 59:63)

"I'm still the same person but it's just that the way that I'm doing it, because they can't see what I'm actually trying to say, you just got to type things in a little bit differently, word things differently, so that nobody could take offence at what you're saying or anything when you're typing it in. If you were speaking it then, face to face, then you could say it differently. But the thing that I'm always trying to put across is always the same, once I'm a different person on-line". (Interview 30, 118:126)

Interviewees also reported that they tended to be quite careful when using their *humour* on-line. They found it quite difficult to make jokes and use sarcastic remarks because they were afraid that they might be *misunderstood* by their peers.

"Yes. It can work both ways I think because, if you are in a group of people face to face - you might mess around and tell jokes and stuff just to break the ice - whereas down a phone line or whatever you can't really do jokes because you can't gauge other peoples .. you can't see other people laughing and you've got to be more careful what you say, you can't just say like a sarcastic remark because someone could take it the wrong way - so you've got to be more careful in that sense". (Interview 31, 63:69)

Interviewees also remarked being extra careful with their use of humour in cases when group participants *did not know* each other very well.

"But if you don't have a face to put the name, and even now I am not too sure about one or two of them, when you e-mail strangers you have to be extra careful of what you are saying, you don't tend to joke as much obviously, and even if you do you are very careful about what kind of jokes you are doing, also when you type something people read it differently". (Interview 11, 127:131)

"I do act differently when I am on-line with people because I don't know them very well, whereas in the face-to-face you get to know the members of the group and that makes things different and then you can speak freely. On-line on the other hand, you don't really know to whom you are speaking, so you have in a way be careful of what you are saying. So, the way you speak through this to modes of communication is different". (Interview 13, 92:99)

The next interviewee notes that the absence of visual contact is the reason why she chose her words carefully. This arose from her inability to recognise someone's appearance and social

background.

"When you're actually using on-line communication for the first time, if you haven't actually met the people before, if you can't physically see them, I think you're always a lot more cautious with what you're saying and stuff like that because when you actually meet people and you can see them, you tend to be able to assess fairly well what kind of person they're going to be and how you can actually get on with them. So if you can't actually physically see them you've got no idea what their kind of social background is, what their appearance is and what kind of social group they fall into. It's very hard to actually kind of pitch the language at the right level and stuff like that so it's not always as easy to communicate quickly and effectively in the first instance". (Interview 36, 82:90)

### 4.3.7 NEED TO BE CLEAR

Finally, interviewees reported experiencing the need to express themselves in a clearer manner than they usually did during their face-to-face meetings. The reason for this deals once again with the existence of the on-line environment, which made group participants insecure about what they were saying and whether it was going to make sense. Therefore, in order to *prevent ambiguity* they needed to express themselves *more clearly*.

"Yes, I think that on-line you have to explain a lot more, this is happening because of the lack of the physical presence again, because the person is not there and is not seeing you, you feel that you have to be more clear on the things you say". (Interview 04, 97:99)

"You have to be clear what you're typing, I think because you can't show your emotions or anything like that through a computer communication but as long as you explain what you want quite clearly, you should be all right really, it's only major misunderstandings really". (Interview 37, 350:353)

However, the level of clarity someone is trying to achieve during the on-line interaction depends also on the level of the relationship that person has with the rest of the group members. If the group consists of participants *who do not know* one another and they have not established any sort of relationship, then the need to speak more clearly becomes greater.

"It always depends on who you are trying to approach, if it is somebody new that you never met I tend to be more clear, logical about what I am writing or saying for example through e-mail. But if it is someone I know from the group I can then have a laugh, make jokes". (Interview 07, 93:96)

Attempting to make themselves clear in what they were saying and meaning, group members

used some "techniques" and "strategies" to overcome the problems of on-line communication, and to *avoid being misunderstood* by their peers. Some of the interviewees reported that they tried to use *longer sentences* and *bigger paragraphs* in an attempt to explain themselves in detail.

"Yes I think I am more open perhaps, in a way I think I tend to say things in a longer way than I do when I am talking to someone because I don't want to be ambiguous I want them to understand completely the meaning. So, that tends to mean that I have to write a whole paragraph of what I want to say rather than just say something to someone face-to-face and if they didn't understand they would ask me a question. So, yes from that point of view you are expressing yourself in a different manner".  
(Interview 18, 142:147)

As in the next two quotations the use of long sentences appears to be a characteristic of the non-native speakers. It seems that *non-native speakers* felt more uncomfortable when they were trying to express themselves in a foreign language. Therefore, in an attempt to make themselves more clear they use a longer sentences, trying to compensate for their limited language skills.

"I prefer to communicate with those people on-line because I can understand better what they are saying, if you are quick enough you can even have a dictionary and use it the same time you are interacting on-line. I think that I more understand people who are not having English as their mother tongue, native English speakers tend to use short sentences, plus the use slang and I cannot really understand them, but not native speakers they tend to use longer sentences because they want to express themselves more clearly, and to be understood by other people. I personally prefer the long sentences". (Interview 40, 0:416)

"When I am on-line, the conversation will be more formal I guess because I am a foreign student when I type my English is more academic I guess, it is more a formal writing. On the other hand, people are using more short sentences when they speak on-line especially when they are using chat rooms, but I personally prefer to use long sentences when I am trying to say something, when I am trying to express myself because I want to be understood from my group members". (Interview 40, 3:117)

Additionally, group participants experienced the need to clarify what they were saying and to provide their peers with *extra explanations*, attempting to become clearer, to prevent ambiguity and eventually *establish sense-making*. The reason for this is linked again to the lack of direct interaction and lack of inclination.

"Even with people you know, I mean sometimes you need to clarify something afterwards, because it does need clarifying because people read it differently and there

is no inclination which is one of the disadvantages".  
(Interview 11, 1:134)

"Yes, I think that on-line you have to explain a lot more, this is happening because of the lack of the physical presence again, because the person is not there and is not seeing you, you feel that you have to be more clear on the things you say". (Interview 04, 95:99)

However, explanations and clarifications given are *time consuming*.

"It takes more time for explaining, it takes long to take your point across". (Interview 15, 310:311)

"The time I had to spend on-line compared to face-to-face on a specific task was increased. More people contributed face-to-face because more people wanted to do the task, and I don't know on-line there was only two people talking at one point it seemed and they were only talking in little sort sentences, so explaining everything would take a lot longer on-line. I don't really know what it just seems to take a lot longer on-line. In the on-line we would spend two hours on Fridays working constantly on-line, but when we meet face-to-face we would have a fifteen minutes meeting, so it was a lot shorter". (Interview 20, 401:407)

Eventually, the provision of explanations, as group participants go constantly back and forth in an attempt to be clear, might discourage group participants. Thus, they had to be selective in order to prevent losing extra time.

"Because you don't spend as much time after a while in trying to understand the meaning behind it, because it is just so hard so you cannot respond either, because you don't know what they are talking about. I suppose you could ask them to explain a bit more, but I am not sure if I want to go through that at all, I am not sure.

*Did you ask for explanations then?*

No, because as I said I got to the point where it was very difficult, and maybe because it isn't as interactive as face-to-face you just don't bother as much. Sometimes, there isn't necessarily a new viewpoint to be expressed and because you are so tired of making an effort to understand you just don't bother any more. It depends though, because some people are more interesting than others so you want to spend some more time with them, because the discussion is going, and people tip in with their views, or they would argue a point back and forth, so you spend more time with these people really, so you've got to be a bit selective a well though because you don't have so much time allocated anyway".

(Interview 28, 260:275)

## 4.4 EXPRESSION: CONSEQUENCES

The ways interviewees used in order to express themselves in the on-line group led to a number of consequences.

### 4.4.1 AMBIGUITY

Interviewees found it particularly difficult to express themselves in such a manner as to prevent *ambiguity* in the written form of communication.

"To take another person's perspective on-line it is quite difficult, because they only think that you get from the other person is a set of words, what they type, so in a way that creates ambiguity in the words, it is really hard to tell which is the key point you want, or what the person really wants to say". (Interview 26, 393:398)

The reasons why group members perceived having to be clear in their sayings is mainly linked to the *absence of social and communication cues*. Facial expressions and gestures cannot help group members to confirm the meaning of the words. Therefore, group members felt that they had to be completely unambiguous in what they were saying.

"But at the same time on-line I have to make sure that's completely unambiguous what I am saying because I should not use any facial gestures or anything like that to confirm what I was meaning if I was serious or if I was joking or that sort of thing. Joking on-line it is quite difficult". (Interview 18, 118:125)

As explained before, group participants used a number of strategies such as longer sentences and paragraphs in order to prevent ambiguities.

"In a way I think I tend to say things in a longer way than I do when I am talking to someone because I don't want to be ambiguous I want them to understand completely the meaning. So, that tends to mean that I have to write a whole paragraph of what I want to say rather than just say something to someone face-to-face and if they didn't understand they would ask me a question. So, yes from that point of view you are expressing yourself in a different manner". (Interview 18, 142:147)

### 4.4.2 MISINTERPRETATION

On the other hand, ambiguity of words and the lack of traditional communication cues can lead to *misinterpretation*. The main reason group members had to be careful of what they were saying during the on-line group interaction was linked to the avoidance of

misinterpretation. Misinterpretation can be mainly caused by the way group participants translate of their peers' words.

"The disadvantages are that you can get misunderstandings because of the way someone says something".  
(Interview 31, 353:354)

"When you speak to a person face-to-face from the way they speak you can tell the meaning but if it is on-line you can take it in so many different ways".  
(Interview 05, 126:127)

Once again there is *lack of facial expressions* and cues to reinforce and the group member's meaning. Their absence can lead to misinterpretation.

*"Do you find that you express yourself on a different manner when you are on-line and face-to-face?"*

I wouldn't express myself as much because as I said I'm slow typist. Also you don't have the facial expressions - I don't think it can be as expressive. You have to be careful as well of what you're saying. Well, you can say so much with just the nod of your head but like when you're typing away, what you're typing may suggest what you don't necessarily mean. A person can take offence at something you just didn't mean him to take offence by.

*Do you think then that it is easier to misinterpret something when you are on-line?"*

Yes, it is easier because you do not have facial expressions to help what you are saying". (Interview 35, 115:128)

So, what do group participants need to do in order to prevent misinterpretation? They need to take their time and think about their input.

"Oh yes, that definitely has happened before, but I think the I use it the more I learn to express myself more clearly using on-line facilities. I mean if you want to say something and come as you want it, something might be missed out, and I think that people might take it the wrong way. if you try to say something quickly and type it like that it makes it more difficult the other person to take as you meant it. And I think it is important to take the time and make sure what you said looks the way you wanted to be said, then send the message or whatever. I think that I've learnt to do after having experience where someone took me the wrong way". (Interview 09, 163:170)

"You have to think well before you actually write something, how it's going to be perceived by the person who's reading it". (Interview 30, 59:63)

### 4.4.3 SENSE MAKING

On-line group communication based on all the factors explained in the action interaction strategies and conditions might lead to *sense making* or not. Due to the lack of communication cues that group participants tried to be clear enough, so their peers would understand the meaning of their words. The techniques to achieve something like that linked with the use of *bigger paragraphs*, as explained before.

"Yes I think I am more open perhaps, in a way I think I tend to say things in a longer way than I do when I am talking to someone because I don't want to be ambiguous I want them to understand completely the meaning. So, that tends to mean that I have to write a whole paragraph of what I want to say rather than just say something to someone face-to-face and if they didn't understand they would ask me a question. So, yes from that point of view you are expressing yourself in a different manner".  
(Interview 18, 142:147)

The establishment of sense making also depends on the mode of communication used. It seemed that the synchronous mode of communication made things more complicated and sometimes resulted in non-sense making.

"I think you tend to focus on one issue, and that can be good or bad. If it goes off track you'll focus on some other issue and you'll never really answer the question you set out to answer and also if it's a chat thing and it keeps scrolling every time someone hits return you're so busy looking at what's happening up there, that you end up typing something that makes no sense at all. You've answered a question that was there 10 seconds ago and the conversation's moved on. It's difficult to do, you see I guess the difference between using a chat and online or a telephone call, is if I'm talking to someone on a telephone call, they'll say something and then they'll wait for the answer. In a meeting if there's more than 2 people I might say something, and then you might respond and we might think what does so-and-so think. On-line you don't do that, there's where the competition starts it's like who can write the most and everyone else gives up and goes home".  
(Interview 25, 537:547)

Another type of users connected to non-sense making in the on-line group deals with the *non-native speakers*. Non-native speakers' use of language could easily lead to misinterpretation. Therefore, group participants could not establish sense-making.

"Yes, definitely language is definitely a problem, not as much in our group work, but before actually splitting into group and doing our group project, and we had to discuss our topics that they had been brought up in the lectures, I did notice that a lot of the overseas students had real difficulties with the language, because you would have a massive, big paragraph or sentence without commas and

fullstops, and you just couldn't understand what was going on there at all, you couldn't understand the thoughts behind, some of the words, and I found that very difficult. Because you don't spend as much time after a while in trying to understand the meaning behind it, because it is just so hard so you cannot respond either, because you don't know what they are talking about. I suppose you could ask them to explain a bit more, but I am not sure if I want to go through that at all, I am not sure".  
(Interview 28, 254:264)

"Because you realise that you can blather on, you just can come out of these huge rooms after talking to somebody and they still understand you, and you can see that they are understand you, because of their body language expressions. But if you write a huge, big, massive sentence on the Weboard for instance, and you read back over it, maybe it is not making sense, so you have to go back and edit it, and then you try to make it sorter or something so it doesn't look disorganised". (Interview 28, 117:122)

#### 4.4.4 FLAMING

During the interviews few instances were found when group participants admitted coming across flaming. Flaming could take the form of negative or rude behaviour towards certain group members. Interviewees, who had experienced flaming, admitted feeling *threatened*, upset or even angry by such behaviour.

"The thing was that I was getting frustrated and I didn't know how to use something or I wanted to know something how to use it, I kind of picked up some name to ask and that person reacted negatively and it was quite annoyed at me, I was very polite I did my best and the person was quite rude and used some strong language, so I was quite taken of that fact because I did not expected that. So, even though it is on screen just a few words, you don't know the person you feel threatened, you actually feel angry and upset. I felt strange I reacted so strongly even with something like that, it is like I know there is a person behind all that and that is maybe why it make me feel like that. After that the person had the decency to apologise for being rude before because he was involved with something, I found that quite amusing and after that went a lot better knowing that the person wasn't rude he was just distracted with something else. Here is another thing you don't know if it is a he or a she, I felt the other person was a he and actually was a she, and she thought I was a he and it was really strange, it was that embarrassing because it was just a joke really, but the thing is I know that here are suppose to be more male users, apparently there is more middle aged users".  
(Interview 11, 281:296)



Flaming could also take the form of careless and offensive comments towards certain group members.

"I've done on-line group learning in the past, I was actually I did an experiment for a friend and I think I was a bit more offensive towards people. There was a girl once who spelled something wrong and I made a comment about it and I annoyed her, the other thing was that she was at the same room as well, that it was strange. I wouldn't do the same thing now that I am experienced". (Interview 23, 72:76)

However, in general terms, interviewees did not report flaming, and expressions of very negative behaviour. A possible explanation for this could be the interviewees' awareness of flaming and its consequences. Group participants, being aware of flaming and its disastrous outcomes for the group interaction, tried to avoid putting themselves in such a situation.

"Disadvantages I don't really know I haven't really come across with any flaming so I don't know, I mean we talk about it but I haven't actually been expose to it so I cannot really comment on that. You obviously are in isolation so you might have an idea about something and you might send it of to people but if you don't get any feedback from your letter you are wondering did they like it didn't they like it, you are relying on other people responding to you to your messages, you cannot always guarantee that, whereas in the face-to-face situation they there they cannot escape from me, you are going to get a reaction". (Interview 18, 279:286)

"I think it was a bit biased in our case because we already have done things on flaming, and we have used the Internet before that, in a lot of course sessions we did flame each other but because we knew what it was we were a bit careful. You just are more aware of the fact that you are doing it because you have been taught about it". (Interview 21, 185:188)

#### **4.4.5 CHAOTIC COMMUNICATION**

Another result of the on-line group communication linked with the way group members expressed themselves deals with more practical issues. Interviewees reported experiencing a *chaotic communication* during their group interaction. The code of chaotic communication is mainly linked to *software use* and *structure*.

"On the other side of things it gave us all a bit of a headache I think it was more the way the software was structured really, it was very chaotic - too much information so sometimes you logged on and their were too many messages and people just gave up towards the end because of that. But the whole idea of being able to e-mail someone in Portugal or Greece and talk to them about things, it would

give you a perspective you just wouldn't get if you just talked to someone". (Interview 25, 55:60)

Along with software design and structure that affected the way group members expressed themselves on-line, chaotic communication was also found to be related to *technical problems* arising during the on-line group interaction.

"I guess because I'd done it once before and using First Class, it's quite efficient software, it's very fast, you can do the chat and it's great, you can save and all sorts of things, it's really good. So maybe I was expecting it to be a bit easier. I guess I expected a lot more synchronous conversation and it turned out to be more asynchronous. It probably wasn't just software, it's OK when there's 2 people but when there's 30 people all talking to their colleagues in Greece and Portugal amongst themselves there's real infrastructure problems, in terms of the band width just cannot handle that sort of traffic. Things get delayed, and when things get delayed people get out of step with what the conversation is, someone's asking one thing and someone's answering a question that isn't relevant any more, and it just becomes one big mess. That's a problem. When we did it using First Class a couple of years ago, that seemed to have things more efficiently, but it wasn't so much 3 of us in the UK had 3 separate computers, it was more 3 of us went with one computer and one person was typing something, and we'd say, oh yes ask them this, and we waited for a response - also this was international, that was within the University so we'd all known each other before, so we were quite prepared to wait for the responses. I think here, because we didn't know what they were going to say or if they were going to say anything, whether it was then confused, then not looking at the screen, or whether it was that the message just hadn't got through. People just carried on typing so it was a lot more chaotic". (Interview 25, 551:569)

Chaotic communication and the confusion caused by the above could easily lead to group members' discouragement.

"This is difficult I cannot remember. Towards the end the motivation went a little bit off, partly because of the software, actually quite a lot because of the software. It really it wasn't keeping up to the pace, because you could really organise the messages very much, especially when you had a huge thread of these particular subjects, it was very difficult to write a particular message. Seeing where the new messages were was failing because you couldn't understand where a particular message was referring to. So, it wasn't very manageable, and it seemed to crush lots of times as well. So, it kind of demotivated me in terms of using the software, I think it was the deadline at the end that kind of got us back on to it again. But we didn't really use the software until towards the end". (Interview 28, 310:319)

## 4.5 EXPRESSION: CONTRADICTIONS

In this section of the presentation of the results information is provided on data derived from the interviews on the way group members admitted expressing themselves in face-to-face situations. Data provided by the interviewees is presented next in Figure 4.2.

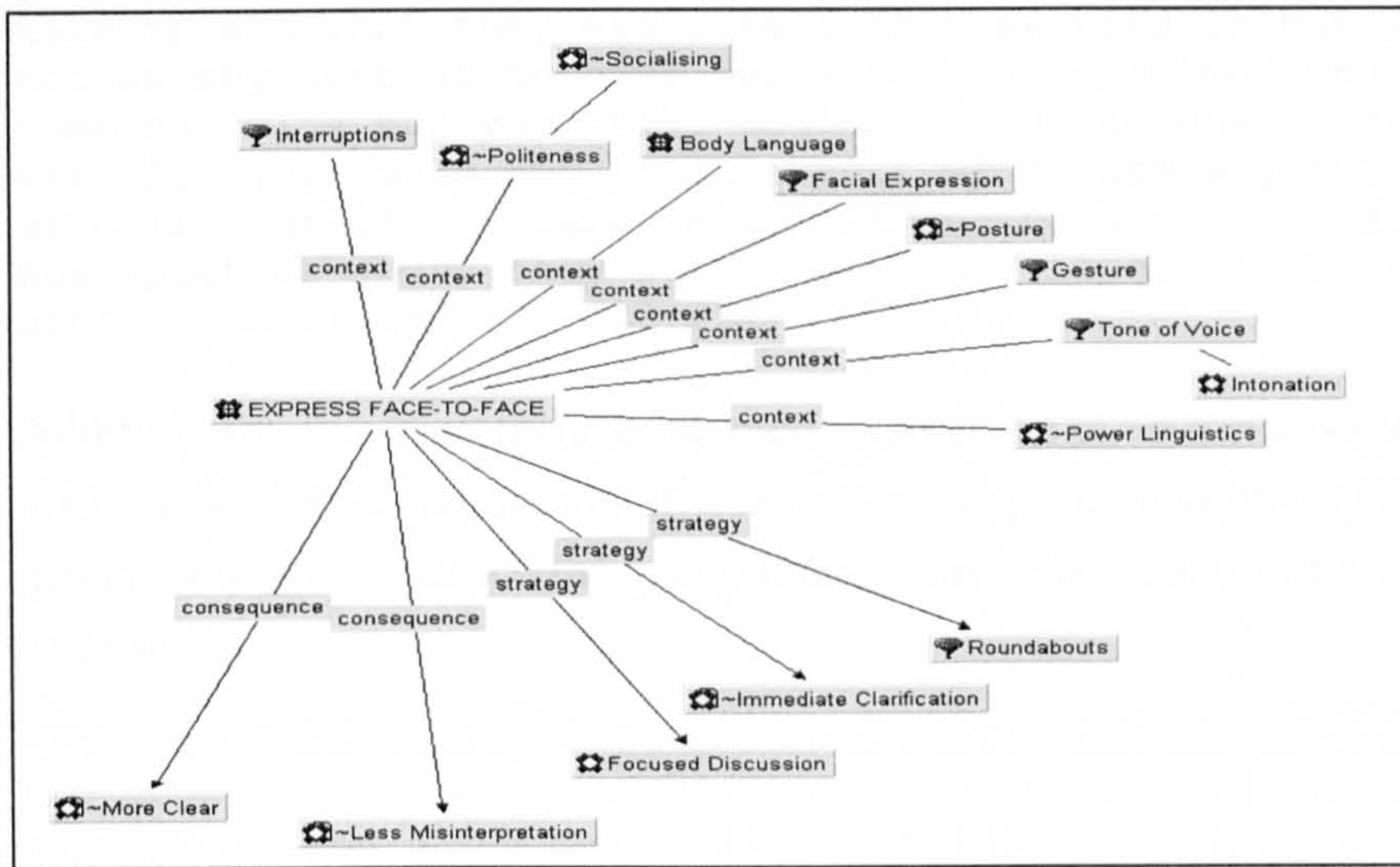


Figure 4.2- Ways of Expression in Face-to-face Situations

### 4.5.1 CONTEXT

According to the interviewees one of the main characteristics of face-to-face group interaction deals with the fact that some of the group members tend to dominate the conversations. Therefore, the less dominant group members run the risk of getting *interrupted* whenever they try to express their opinions in the group.

"I mean I do feel I am a bit interrupted. It's not necessarily that they're being more people who are more dominant, and there's quite a few people in our course anyway who are fairly outspoken, and not being one person's group who I wouldn't really have said was very, not so much dominant, but very visible in terms of the way he talks and the way he always gets up and quite often tries to bring up objections to those points. So, I think it's partly not being with those group members and I mean I'm not particularly shy about what I think. It's not necessarily because of an on-line environment, it's because of I see no real need to argue people's comments". (Interview 48, 185:193)

Evidence from the interviews suggests that *politeness* is mainly a characteristic of face-to-face group communication. Reasons why group participants felt that they had to be polite in a face-to-face group situation were explained. In this situation a group participant can see his/her peers' immediate reactions when someone is not polite and face the consequences of their behaviour. However, the immediate reaction to someone's lack of politeness is not seen

in an on-line interaction.

"I think you have to be more polite face-to-face but on-line you don't have to be as polite but you still have to be polite. You can't just say what you think and just blurt it out, you still have to consider how other people are going to take it and what they might feel if they read it but you're not as shy sort of to come out with your opinion, you can come out with but you still wouldn't just come straight out with it. You would put it in a sort of polite way but not as polite as if you were face to face, because you can see how upset or angry they get so you tone it down a little bit". (Interview 30, 218:224)

Additionally, in a face-to-face interaction a person is, in some respects, obliged to socialise, obeying his/her social nature. Therefore, being polite and having a social chat with the other group members is part of the group interaction before continuing with the work, which needs to be done.

"Face to face really - it doesn't really matter so much with the computer. I don't bother that much with politeness really anyway. If you saw someone if you first went to a face-to-face meeting you'd probably talk to them for a few minutes at least about just random things before you got down to what you wanted say, but if you're on-line you'd probably say, how are you or something before you started going and waffling around". (Interview 37, 148:154)

As has already been mentioned, the way group members express themselves in face-to-face communication is very different (sometimes radically so) to on-line interaction. However, the main reasons for such a difference are connected to the use of *body language*, the *facial expressions*, the *tone of voice*, *gestures*, etc, which all come under the umbrella term of *communication cues*. The interviewees reported that one of the main characteristics of face-to-face communication deals with the use of *body language*. This communication is based on the movements of the body and is used for expressing thoughts and feelings. Of course, as with many things in life, something is most appreciated once it is lost. Therefore, interviewees talked a great deal about the use of body language in face-to-face communication to support arguments.

"You get eye contact and all that stuff you can use your body language and - it's not something you would normally think about but it's only when you actually use computers that you realise how much you miss it. It's expressions you just can't put across". (Interview 35, 419:427)

In a face-to-face situation body movements indicate people's intentions, even if there is no verbal support. Therefore, group members can be more sensitive to the way other group members react on certain matters.

"Face-to-face you can read other's body language because sometimes people might not like something but they don't want to say so you can actually tell that in person or at

least try to read it and be sensitive to how they might be feeling". (Interview 11, 200:202)

The use of body language can prove to be essentially useful in cases when *non-native speakers* are attempting to express and explain themselves.

"If you use face-to-face you can use your body language to explain better so I must say that I prefer face-to-face for that. However, if both of us we are using our mother tongue, then there is no problem to use the on-line environment and take a person's perspective, even if the person is not coming from the same background as you can express yourself clearly and you can make the other person understand what you are saying". (Interview 22, 460:472)

Body language can also play the role of lie detector. In cases where group members are making false statements, it is much easier to interpret this, and prove them wrong.

"No, mainly it is the body language, I could say that I believe in certain things and I've done certain things but ultimately if I will be laying you can pick up at me. It is a good thing to speak to someone on-line there is no problem with that, but I still rather meet them at some point some time so I can see where they are coming from, see what they actually believe or not". (Interview 23, 421:425)

So, interviewees recognised certain movements and characteristics of body language used to expressing themselves and to emphasise what they were saying and indicate their intentions. Group participants used certain *gestures* or *postures*, *facial expressions*, *tone* of their *voice*, or *special intonation*.

#### Gestures:

"I think it helped, in a way it helped but it doesn't provide the help that anyone would expect. For example when you are talking to a person there are certain things that you express them better orally than in writing, the certain gestures, the sound of your voice make a difference and make people understand better what you are talking about and what exactly you mean, but it is different in the written form". (Interview 24, 404:408)

#### Postures:

"Whereas in a group face-to-face environment you're actually saying things, you get all the non verbal communication, the body language, the posture and a lot of the kind of message that people actually portray to other people is actually through body language and stuff like that". (Interview 36, 125:128)

#### Facial expressions:

"Yes, yes, if it is face-to-face sometimes we would negotiate, I would be so sharp and I won't insist on my point of view because when it is face-t-face I can tell by other people's facial expression when they are listening to my opinion if they like want I am saying or not". (Interview 26, 107:112)

"Yes, I really do first of all when you are face-to-face with someone you can see them all the time, there is a visual contact, you can understand and judge from someone facial expressions if they agree on something or they do not like something else".  
(Interview 29, 109:114)

### Tone of voice/ intonation:

"For example when you are talking to a person there are certain things that you express them better orally than in writing, the certain gestures, the sound of your voice make a difference and make people understand better what you are talking about and what exactly you mean, but it is different in the written form".  
(Interview 24, 405:408)

"Sometimes you don't quite get the complete meaning, you can just read more sentences and change the whole meaning if you have a different intonation". (Interview 11, 202:204)

"Definitely one of the major disadvantages is the loss of non-verbal communication like the body language, it much more difficult to put across a message, there is a lot of intonation, there are a lot of visual signals that are missing, you cannot understand if someone is being sarcastic, you can only guess and then get the wrong message".  
(Interview 09, 137:140)

### Power linguistics:

"Whereas in a group face-to-face environment you're actually saying things, you get all the non verbal communication, the body language, the posture and a lot of the kind of message that people actually portray to other people is actually through body language and stuff like that. I mean I've done 'A' level communication studies and for some of the work which I've been doing for the group work, I've actually been reading through some of my old notes and it says that investigations show that only like 7% of the message is taken through the actual words people say. Like 55% is through non-verbal body language and stuff like that and the other like 38% is through power linguistics, the way people speak and stuff like that, so if you're actually just typing the message you're losing the whole element of how people are interacting and stuff like that".  
(Interview 36, 123:134)

## 4.5.2 STRATEGIES

As action strategies, forced by the use of all the different characteristics of the face-to-face situation and body language, interviewees reported that their discussion was more focused, as immediate clarification on what they were saying and hearing was provided.

"Well as a said face-to-face you are going to get a reaction because everybody is there, I think you can have more of a discussion, I think the environment will help people to discuss more, whether that discussion is going to be focused on the topic or not is another matter. I think it is good just from a the group dynamics point of view to see the other people, I think it helps to know their personalities slightly wider as well because you know how to talk to people then and how to interact with them in order to get the best out of them, if you see what I mean". (Interview 18, 290:296)

"Face-to-face I think that there is a immediate clarification, if you miss a word you can clarify it immediately with me, but in an on-lie situation you have to wait for the e-mail to come back, the delays, the time you lose is very important, in between lots of things can happen, can intervene". (Interview 24, 261:264)

However, group participants found themselves using more roundabout ways of expressing themselves and not being very direct with their peers. Choosing to express their opinion in a more roundabout way seemed to be mostly a characteristic of shy group members.

"Yes I think yes, personally I think I am more open on-line and more likely to say what I feel, I am not going to extremes but yes I would be more likely to say no I disagree with that than I probably would do face-to-face or at least if I did it face-to-face I would say in a roundabout way or in a certain manner, but I am not so concerned being myself on-line". (Interview 18, 118:121)

"Probably, but I express my opinion anyway, face to face, so if I think something I will try and say it as best I can even face to face. If I'm on-line I will probably just type it out and say it on-line or write it on-line. Face to face I'll probably not come straight out with it, I'll probably try to get my point across but in a subtle way rather than doing it on-line". (Interview 30, 140:144)

## 4.5.3 RESULTS

Therefore, group members managed to express themselves in a *clearer manner*, to get less misinterpretation and establish understanding.

"Face-to-face it helps because you can get to express your ideas more clearly face-to- face. If you were trying to do this interview on-line, it would be very difficult. You are probably getting more compressed and more specific but you

probably lose some ideas on-line". (Interview 21, 353:356)

Group participants also managed to *prevent misinterpretations* more easily when face-to-face.

"Face-to-face I think that there is a immediate clarification, if you miss a word you can clarify it immediately with me, but in an on-line situation you have to wait for the e-mail to come back, the delays, the time you lose is very important, in between lots of things can happen, can intervene". (Interview 24, 260:264)

"I think it's a bit harder, because you can't see body language or facial expressions. If you sent me a message and I misunderstood it then you'd be stuck, but if you say it face to face, then I could only be joking or something, the misunderstanding they become more clear when you are face-to-face". (Interview 34, 401:404)

## 4.6 DISCUSSION

### 4.6.1 CONTEXT

The analysis of the interview data revealed four main contextual categories related to the way group members express themselves in the on-line environment. The first was named *Keeping a Record of Activities* (or archiving) including quotations where interviewees addressed the issues concerning the fact that the group members had the opportunity to keep a record of everything that had been said during the on-line interaction. For Albrektson (1995) one of the advantages of online seminars is that all contributions can be preserved by thread-topic, saved, edited by participants and therefore become permanent records for future reference. Additionally, a number of researchers recognised the importance of record keeping in computer conferencing (Kaye, 1992; Orlikowski and Yates, 1993; Rimmersahw, 1999).

Our findings suggested that group members used this added opportunity given by the environment mainly in two ways. Firstly, as an *Aide Memoire*, in other words, as a memory assistant, a diary to help them to remember things related to the group activities. Thus, in the cases where group participants were unable to remember something that had happened during the group interaction, or what a person had said, then it was possible to go back and remind themselves. This seems to agree with Feenberg's (1989) comment that "a group which exists through an exchange of texts has the peculiar ability to recall and inspect its entire past" (p. 25). Indeed, especially the asynchronous mode of group communication provides the group with the advantage of a record-keeping database where all the group contributions are kept. Through that, group members have the ability to recall or link ideas expressed within the



group.

Apart from a memory assistant, group members used the on-line environment as a reference, a repository of information. As action arising from this condition, group members are provided with a number of strategies. They can check upon previous information. They can allow themselves the time they need to reflect and absorb information given. Kaye (1992) seems to agree that the record of messages of the group member's contributions can be used as a basis for reflective analysis. Group participants also could keep track of what had happened in the group, so they could rejoin the conversation going on at any given time if they had had to go away for a certain period of time. Finally, group members could use this repository of information as a source of information, at a later stage, that provided them with new ideas when they were lacking inspiration.

The second contextual category related to the Expression code is *Reducing Interruptions*. This includes all the quotations where interviewees talked about the fact that the on-line environment helped people to diminish interruptions by the more dominant group members. Group members reported that one of the main characteristics of face-to-face interaction were interruptions by more dominant group participants. As a result of the interruptions, less dominant group members could be really disappointed or even stop participating in the group. However, it seemed that the on-line group environment helped to reduce those interruptions, which characterised face-to-face communication. In the on-line environment, group participants were provided with the opportunity to compose their contribution, elaborate their points of view and then send them. It seemed that reduced interruptions helped group members to build their confidence and assisted them in making more detailed contributions. The encouragement provided by computer conferencing environments allowing group members to write and therefore participate, at the same time reducing the possibility of interruptions by the few dominant participants, has been discussed in the literature (Mason & Kaye, 1990; Eastmond, 1994). As Harasim (1993a) commented on CMC environments "cyberspace environments such as educational computer conferencing do not entirely eliminate domination by a few more vocal participants. What is new and different is that dominance by a few does not exclude the ability of others to have their say" (p. 124).

The third category placed with the contextual conditions of the *Expression* code was named *Time to Think*. This code refers to the fact that the on-line environment allows group members to take the time they need to reflect on their contribution and then send it. In particular, the asynchronous mode of the on-line interaction has proven to be quite helpful, as it gave time to the group members to reflect on their contribution and therefore, come up with more constructed thoughts. This finding seems to be supported by several studies (Murphy et

al. 1998; Turoff, 1989; McConnell, 1997; Orlikowski & Yates, 1993) which found the asynchronous mode of on-line communication especially beneficial for reflection, fine-tuning of ideas, and improving quality of discussion (Karayan & Crowe, 1997).

However, group members did not only have the time to reflect but also to edit their inputs. This means that they are allowed to have the time to read their input, make the improvements they want and then send it to the group. As a result, interviewees admitted managing to be more precise in their writings and making clearer, proper, sentences and statements. Another result is that, the group members became more confident once again. It seemed that the *Time to Think* particularly suited non-native students. Assuming that non-native students are likely to come across language barriers, they therefore require more time to think before composing an argument on-line; the extra time provided by the on-line environment was highly appreciated by the non-English interviewees. Murphy et al. (1998) found that on-line interaction was an impediment for non-native students and disagreed in a way with our finding that suggests that non-native students took advantage of the fact that they had to type, and therefore pause and think before composing their contribution. However, Aoki (1995) seems to confirm our finding suggesting that the asynchronous nature of CMC helps non-native English speakers to take their time, reflect and therefore participate easily in international dialogue. Thus, instead of being silent as they do in face-to-face group interactions, they can participate equally in the group, as they have the time to compose their contribution to make it sound more English.

It is quite interesting also to note that the *Time to Think* code also seemed to suit some group member's personal and learning styles. Some people pointed out that they needed to think before participating in the group. There seems to be a difference between people being able to instantly participate in the group and those who need a bit more time allowance to compose their inputs. This finding seems to agree with Karayan and Crowe (1997) who argue that one of the benefits of an electronic discussion group is that it accommodates the needs of all students. They specify two types of learners "impulsive" and "reflective". Impulsive learners are characterised by the urge to respond and make comments on every issue, which arises in the group. On the other hand, reflective learners seem to need more time to reflect on a problem or issue and then respond. Therefore, "discussion groups act as equalisers of opportunity to participate. They give the impulsive learner time to calm down and the reflective learner time to put his/her thoughts together. Often those students who depend on verbal domination in class may be less wordy in writing and vice versa" (Karayan & Crowe, 1997).

There was also another interviewee, who admitted suffering from dyslexia. Although

someone would expect a person suffering with dyslexia not to show a preference for dealing with text-based situations, this girl admitted that the on-line environment helped her to acquire the time she needed to deal with the extra information. She seemed to take the time to reflect on the extra information, which she could not cope with in the face-to-face situation. As a result, she used this extra bit of time to think about and absorb the new information. Turoff (1989) also seems to agree that the time to think which is linked mainly with the asynchronous mode of communication suits people's different cognitive styles.

Finally, the last code placed among the contextual conditions of the *Expression* code was named *Visualisation*. This code includes all the cases where interviewees admitted that the fact that everything was written on the computer screen helped them to make their thoughts more tangible. Hettinger (1995) seems to believe that CMC makes an on-line conversation "tangible" by making it visual. Indeed, the fact that all group members' contributions were visible on the screen seemed to help them attain clearer thoughts on what they were trying to express. As group participants type, they can physically see their words coming up on the computer monitor. They reported that this helped them to visualise what they were saying, making their thoughts clearer. Conlon (1997), using computers to teach undergraduate students English literature and composition both individually and in groups, noticed that students appreciated the fact that the discussion was visible on the computer screen. Therefore, he comments that "as they typed their responses during online discussions, students saw their writing being published right in front of their eyes. Students could then see their writing put to good and immediate use. As students refined their ideas and opinions, the plays and novels they were discussing became real to many students for perhaps the first time in a classroom".

Another added advantage linked with the code of *Visualisation* was the code named *Edit*. Interviewees admitted their ability to edit and make corrections to their contributions, before sending them was assisted by the fact that their contributions were written on the screen. The *Visualisation* code, therefore, helped group participants to strengthen their arguments. As a consequence, group members managed to avoid disagreements and misunderstandings.

## 4.6.2 STRATEGIES

During their on-line interaction group participants felt that they had to express themselves in certain ways. Initially, interviewees reported feeling they had to be "careful", "cautious", and "precise" about what they were saying when expressing themselves. This result seems to agree with literature suggesting that CMC requires a higher degree of precision (McCreary,

1989; Harasim, 1990)

The reason why the interviewees felt that they had to express themselves in this manner relates to the absence of facial expressions and the body language. Group participants feared that their peers might misinterpret their words. *Misinterpretation* enhanced by the *Lack of Social and Communication Cues*, which can possibly lead into misunderstandings. Therefore, group members reported feeling the need to be careful of what they were saying in order to avoid sounding aggressive or even offensive to their peers. The theme of connection between the written form of computer-based communication and the lack of social and verbal cues has been studied widely (Kerr & Hiltz 1982; Kiesler et al., 1984; Feenberg, 1989; Sproull & Kiesler, 1986; Hettinger, 1995). In some studies the absence of physical and social cues was considered to help students focusing their attention on the content of the messages (Harasim, 1987a, Harasim, 1987b).

Additionally, interviewees also reported having to be extra careful with the use of their humour on-line. The reason explaining such an attitude deals once again with the lack of an immediate face-to-face interaction that would clarify someone's humorous intentions. Baym (1995) remarks that research has been slow in addressing issues of formation of group identity and solidarity; however, such phenomena occur in on-line groups and are negotiated through humour. For Baym (1995) humour provides a way of dealing with problematic issues and it can lead into the generation of group identity and solidarity. Therefore, she seems to highlight the need for analysis of humour in the dynamics of CMC.

Additionally, the practice of being careful when expressing oneself in the on-line group also connects to the code of *Group Composition*. Interviewees commented that they felt they had to be extra careful of what they were saying, especially with peers they did not know beforehand, or group participants with whom they have not established any kind of relationship already.

Along with the code of *Being Careful* another code named *Need to be Clear* was placed among the action/interaction strategies of the *Expression* category. In general terms, interviewees reported experiencing the need to express themselves in a clearer manner than they usually did during face-to-face meetings. The reason explaining such attitude dealt once again with the existence of the on-line environment. It seems that group participants felt insecure that their words would not make sense to their peers. Therefore, in an attempt to prevent ambiguity they needed to express themselves in a clearer manner. However, the level of clarity someone is trying to achieve during the on-line interaction was reported to depend on the level of relationship group participants have already established or not in the group.

When attempting to make themselves clearer and more meaningful, group members used some "techniques", or "strategies" to overcome the problem of being misunderstood by their peers. Initially, they tried to use longer sentences and big paragraphs to explain themselves in detail. The use of long sentences and big paragraphs was found to be particularly connected to non-native speakers. It seems that non-native speakers, feeling less comfortable in comparison to native speakers, used longer sentences in an attempt to make themselves clearer and to compensate for their limited language skills. Additionally, group participants when trying to be clearer employed the action of giving extra explanations and clarifications of their contributions. As might be expected, the provision of explanations and clarifications can be a very time consuming and discouraging procedure, and group participants might decide to be selective about their inputs in order to prevent time loss.

In general terms, interviewees reported expressing themselves in a more free and careless manner. Group participants not only felt more free to express themselves in the CMC environment, they also felt *more open* expressing their opinions and disagreeing with their peers. The absence of direct interaction along with the security offered by anonymity was given as the explanation for such an attitude. In particular, group participants, who defined themselves as shy, reported being more open and more able to express their opinions and view points on-line. As has been noticed by some studies the "ephemerality" of electronic communication and more specifically of e-mail can reduce shy people's fear, making them more open (Sproull & Kiesler, 1986; Sproull & Kiesler, 1993).

Group participants, by being more free and open in their communication also managed to become *more informal* and *honest*. Due to the lack of immediate feedback they felt able to express themselves in a more straightforward manner.

In addition, interviewees reported having to employ other attitudes towards their group members. It seems that due to the emotional detachment the on-line environments offers, group participants manage to express themselves in a more *informal* way. Literature also demonstrated that computer-mediated communication promotes lower degrees of formality (McGuire et al., 1987; Weisband, 1992; Orlikowski & Yates, 1993; Rimmershaw, 1999). However, in some cases interviewees reported feeling having to be formal during their on-line interaction with their peers. A closer look at those cases revealed a number of conditions effecting and causing formality. It seems that group participants preferred to use more formal ways of writing when talking to group members they did not know very well, as they wanted to avoid being misunderstood. Furthermore, a special group of people who reported having to use language in a more formal way were the international students. It seems that the interviewees, who were international students, learnt to use the formal way of expressing

themselves in the English language and that they kept doing so during their computer conferencing.

Another issue, which surfaced during the interviews, addressed the use of *politeness* during the on-line interaction. Interviewees commented that they were not particularly concerned with politeness and socialising with their peers. Interviewees commented that they considered the on-line environment a work orientated environment that did not allow space for socialising and therefore being polite. On the other hand, politeness was also mentioned as part of the on-line group interaction but always as being affected by certain conditions. The most common condition under which group participants needed to be very polite to their peers was linked with the non-existence of established relationships among the group members. If the group members do not know each other at all or not very well, then they felt that they have to concentrate on being polite.

### 4.6.3 RESULTS

The reason why group participants tried to be clearer with what they were saying deals mainly with the fact that they tried to prevent *Ambiguity*. Due to the lack of communication cues group members felt that they had to be completely unambiguous in what they were saying. The greatest fear of group members was that their words could lead to *Misinterpretation*.

Additionally, interviewees admitted to a few instances of *Flaming*. Flaming took the form of careless and offensive behaviour towards the rest of the group members. However, it should be noted that interviewees did not report any major cases of flaming. A possible explanation for that would be the fact that interviewees were already aware of its consequences. Therefore, they tried to avoid it. Although the issue of flaming is often reported in the literature (Kiesler et al., 1984; Hiltz et al., 1986; Sproull, & Kiesler, 1986; Lea et al., 1992; Siegel et al., 1986; Walther et al., 1994; Rice and Love, 1987; Collins, 1992) it did not seem to have a strong impact on the people being interviewed. However, some studies found little signs of flaming. Explanations given for the lack of flaming involve familiarity of the group members with each other (McCormick & McCormick, 1992) or engagement with the task demands (Orlikowski and Yates, 1993).

Another result of the on-line group communication linked with the way group members expressed themselves deals with more practical issues. Interviewees reported experiencing *chaotic communication* during their group interaction. Chaotic communication was caused mainly by the way the software was structured, and was also found to be related to technical

problems arisen during the on-line group interaction. Additionally, group participants felt that they did not have enough time to deal with the software, all the received messages and the technical problems, which arose. Such problems caused stress, frustration and probably de-motivated group participants.

Above all the on-line group communication based on all the factors explained above led to the establishment of *Sense Making* or not. Group participants tried to employ a number of strategies in their attempt to establish sense making. Sense making depended on the mode of communication used. It seems that the synchronous mode of communication made the group interaction more complicated and sometimes resulted into non- sense making. The code of *Non-native Speakers* also found to be connected with the non-establishment of sense making code as non-native use of language could easily lead to misinterpretation. Rice-Lively (1996) explored issues of sense making in computer conferencing. She found students invented ways to communicate more effectively during teleconferencing interactions by seeking social sense making interactions.

#### **4.6.4 CONTRADICTIONS**

During the interviews some data was given on the way group participants expressed themselves in face-to-face situations. Interviewees reported that during the face-to-face group interaction, certain group members usually dominated conversations. Therefore, the less dominant group members tended to get interrupted when trying to express their opinions. Evidence from the interviews also suggested that politeness is mainly one of the characteristics of face-to-face group communication. Rude group participants would have to face the consequences of their behaviour in an immediate face-to-face situation. Whereas, in an on-line situation, due to the lack of visual feedback something like that is not possible.

However, what radically differentiates face-to-face from on-line communication is the existence or non-existence of communication cues. During face -to-face communication group participants can use their body language to express their thoughts and feelings, to indicate their intentions. The use of body language can prove particularly useful to non-native speakers when attempting to express and explain themselves. During the face-to-face situation group participants also used certain gestures or postures, facial expressions, tone of voice, or special intonation to indicate their intentions and make their points.

As action strategies forced by the use of all the different characteristics of the face-to-face situation and body language, interviewees reported their discussion being more focused, as

immediate clarification of what they were saying and hearing was provided.

However, interviewees especially the ones who admitted being shy, reported choosing to say things in a roundabout way, and not being very direct with their peers. Finally, due to the use of body language, group participants managed to become clearer in their words and intentions and therefore were less often misinterpreted in the group.



**CHAPTER 5:**

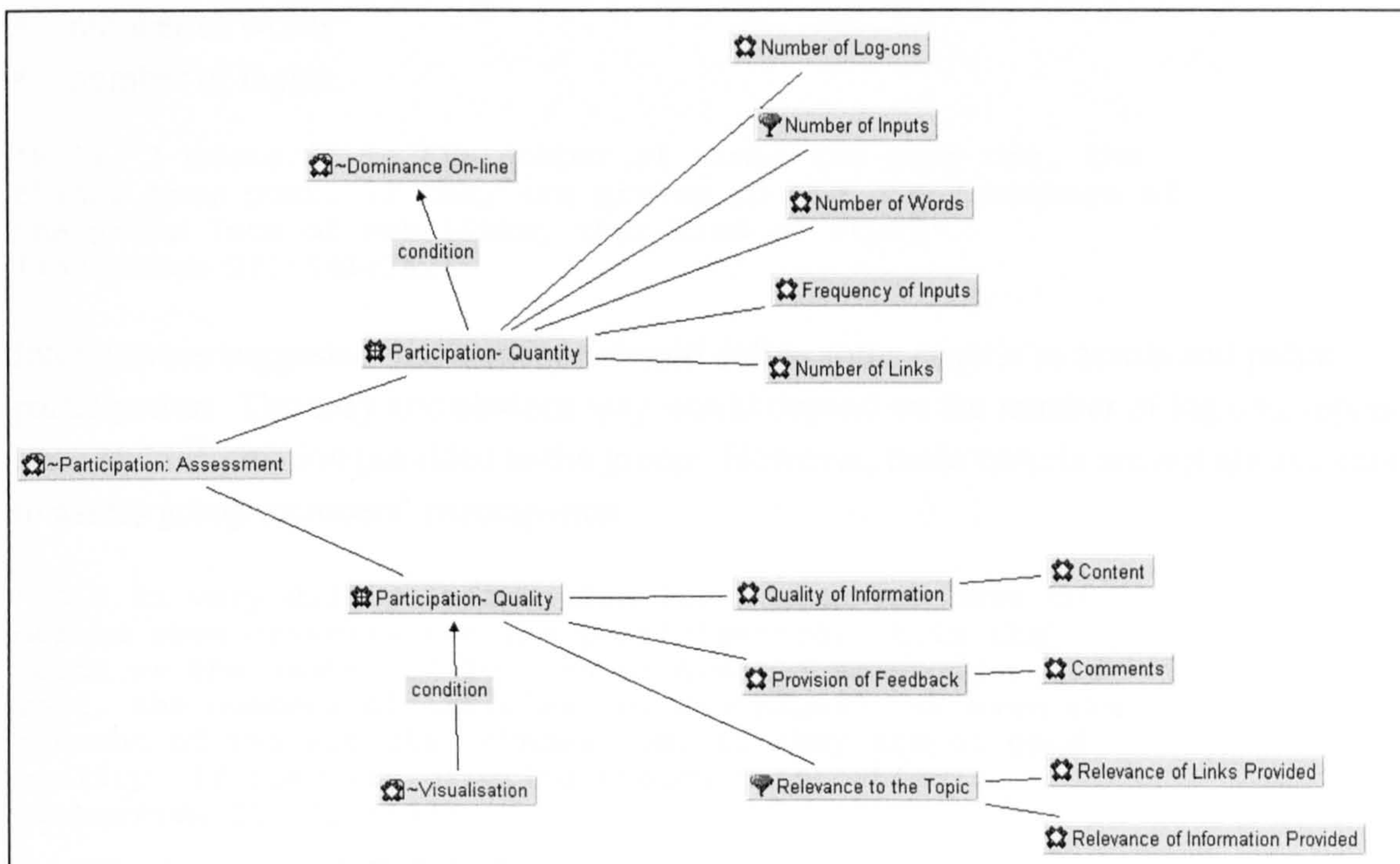
**RESULTS**

**ISSUES OF  
PARTICIPATION  
IN COMPUTER  
CONFERENCING**

# 5. PARTICIPATION IN GROUP COMPUTER CONFERENCING

## 5.1 PARTICIPATION: CONTEXT

The code Participation Assessment that emerged during the open coding procedures was placed with the contextual conditions in the participation code. The *Participation Assessment* code had mainly two subcategories named *Quality* and *Quantity* of participation as seen in the next Figure 5.1.



*Figure 5.1- Participation Assessment*

The question of how we assess peer participation in the on-line group arose during the research. Interviewees reported that assessing and judging someone's participation in a face-to-face situation is rather an easy task for the group members to perform or at least group members are used to assessing peer participation in this mode. When group members act in a face-to-face mode then it is easy to work out who are the group members who participate the most, who are the ones who do not participate, etc. However, during the interviews data arose in connection to the assessment of group members' participation in the on-line group. How do group members judge peer participation on-line? What are the parameters and the criteria used to "measure" the participation of the other group members?

Interviewees provided us with several answers to these questions, mostly supporting the argument that participation is not only a subject of quantity, for instance, how many times a name is appearing on the computer screen. Participation also deals with the content of contributions. Along with quantity (frequency) of inputs (how many times someone

participates, how many times a name appears on the screen), we also deal with quality (content of the input and relevance to the topic under discussion). Consequently, the on-line participation assessment deals with two parameters quality (frequency) and quality (content).

### 5.1.1 QUANTITY

Quantity of inputs judged by the interviewees was based on the following conditions:

- number of links and information provided
- number of log ons into the system
- frequency of inputs
- number of words
- number of inputs.

"Well, I guess it is the number of times the long ons, the things they post, if they are giving to the other members of the group lots of web links, that kind of stuff".  
(Interview 27, 141:142)

Interviewees suggested that someone should define some criteria to assess and judge participation. The easy and obvious way would depend on the number of log ons, inputs, links and information provided to the group. However, these criteria are not always enough to assess group members' participation.

"This is very difficult to judge it, I mean you have to define some criteria for the participation, it is the words or the number of letters or e-mails somebody would send, the numbers of articles, or web pages? or even the content of the articles themselves, if they are of good quality, if they are offering enough information".  
(Interview 22, 150:153)

"Well, I guess it is the number of times they long on, the things they post, if they are giving to the other members of the group lots of web links, that kind of stuff".  
(Interview 27, 140:143)

Another way of judging participation is also the frequency of inputs. However, it seems that even the frequency of inputs is not enough to determine participation on-line.

"You judge by the frequency, how often a person speaks, you can easily see that on the screen and from ideas and opinions someone is expressing, if the things someone has to say are relevant to the topic, how useful they are".  
(Interview 40, 228:233)

Most of the interviewees seemed to agree that it was quality of participation that really mattered instead of quantity.

"I don't think it would be fair to do that bearing in mind the number of times someone's name is on-line because it's

quality not quantity, I mean you could be sending the e-mails all the time but they might not be relevant". (Interview 35, 194:198)

"The way I'd see it would be a number of messages and the relevance of the comments. So you could judge from that really, because you know how people like making lots of messages and lots of input but they're not actually contributing to the topic of interest. So you know you need to take both the quantity and the quality and maybe quality takes more precedence really if it's something like a learning". (Interview 48, 200:205)

## 5.1.2 QUALITY

Participation judgement was also based on the content and the quality of group members' inputs. Quality was found to be based on the following criteria.

- content
- provision of feedback
- relevance to the topic.

However, it is of interest how interviewees determined quality of participation in their groups. It seems that quality was mainly determined by the content of information and links provided, or ideas and opinions expressed by the group members. Another useful way of determining quality of participation was through the provision of feedback.

"If they don't do much, you judge from the things they answer if they volunteer information, it's not really quantity it's more what they actually put in if they give you useful feedback, by sending you a question and things like that, if they bother to answer any of the questions that you've got to answer as a group". (Interview 37, 228:231)

Interviewees also noted that both quality and quantity needed to be taken into consideration when assessing someone's contribution. They reported the relevance of the information provided to the topic under investigation as an important parameter for judging the quality of inputs.

"You judge by the frequency, how often a person speaks, you can easily see that on the screen and from ideas and opinions someone is expressing, if the things someone has to say are relevant to the topic, how useful they are". (Interview 40, 230:233)

"The way I'd see it would be a number of messages and the relevance of the comments. So you could judge from that really, because you know how people like making lots of messages and lots of input but they're not actually contributing to the topic of interest. So you know you need to take both the quantity and the quality and maybe quality takes more precedence really if it's something like a learning". (Interview 48, 200:205)

Additionally, interviewees reported their preference for small but well-developed comments in comparison to massive quantities of text that in the end did not make sense.

"Whereas in the on-line environment they may still try and say as much but because you can actually see what they're writing, because it's actually written, that you may actually be able to devalue their comments and things because in my eyes it's better to have one or two really good excellent comments or points for a discussion than just a long stream of someone writing nonsense because to some extent you're looking for the quality rather than the actual quantity of text. I think it's more obvious when you're actually looking at written stuff what's actually good stuff and what's bad stuff because if someone's sitting there trying to argue their point for ten minutes you tend to be able to switch off a bit just ignore it. Whereas when it's actually written in front of you can see that they're just waffling and they don't know what they're saying". (Interview 36, 222:231)

Some vital points or even a solution to a problem provided are much preferred than large amounts of irrelevant information. It seems that the interviewees preferred the "right" message instead of "lots" of messages. As is also shown in the previous quotations the on-line text-based communication allows group members to value their peers' comments and inputs, as written on the screen. By having them written on the screen the other group members can easily judge whether input is as good as another. This is something that is difficult judge in face-to-face communication.

"If you're trying to do on-line discussion about a subject because you've actually got to physically type the words and then send them, it's not as easy to waffle around them. Whereas in a face-to-face thing people can sit and talk about nothing and make out they know what they're talking about. When you're actually physically typing you've got to think about what you're writing. And then you've actually got to re-read it and send it and then you can see that you don't know what you're talking about. I've witnessed it, I mean I've done it myself, I've done it myself. If you don't know what you're talking about it's like, how do I, how do I write this, how do I get away with writing that. Everyone's done it. I mean you've probably done it as well, you have done. If you're doing on-line discussions like well, I don't really know what I'm talking about what can I write? Whereas in a face-to-face you would try and talk around the subject, waffle around it. Everyone does it, it's human nature. Whereas in on-line, you can't do it. Well you can, but it's obvious that you're doing it". (Interview 36, 298:309)

The following comment made by one interviewee is of interest. He is supporting the idea that people who tend to dominate the group are the ones with the most input. However, once again the frequency of contribution does not necessarily ensure the quality.

"You can't do it by the sheer amount they write because

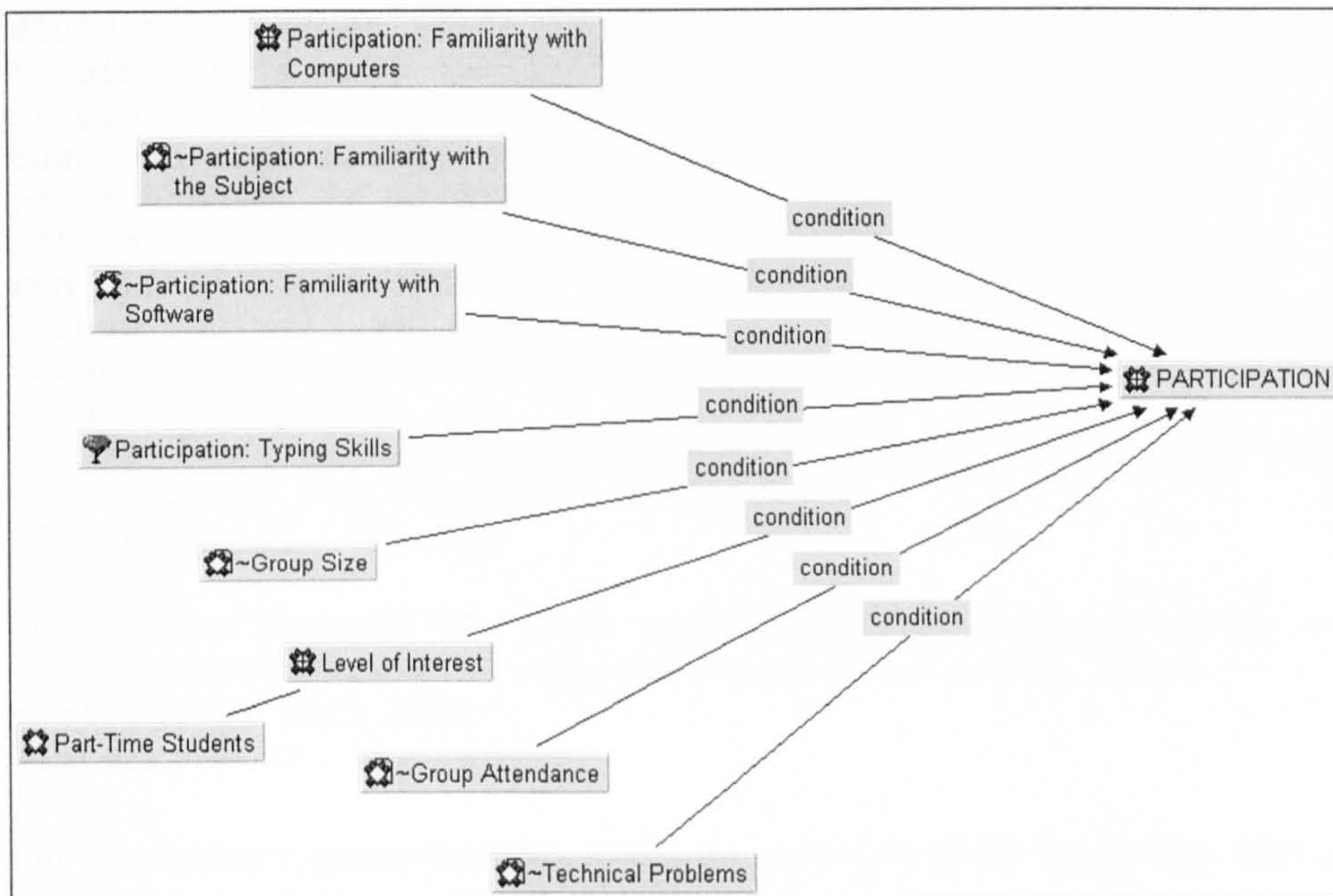
obviously as I've said, someone can sit there and talk for ten minutes and the quality of their message could be 30 seconds...But there again if you're having an on-line discussion, I think in my eyes, it's better if someone doesn't participate as much they may suddenly come out near the end of the discussion with two or three key vital points or a solution to a problem and have not been involved in the discussion much at all. I therefore think it's better if someone gives little and quality information compared to someone who would give a lot of semi-useless or irrelevant information. I think you've got to look at the actual quality of the messages people are sending rather than the sheer quantity of text and information. I don't know if it's the nervous element that people who tend to like to dominate face-to-face discussions whether, or whether it's they like to hear their own voices and things. But it's the same in our on-line group, the person who would dominate you do tend to see their name a lot more than other people. Having said that, in the actual group work we're kind of combining together to actually hand in he is not actually dominating that but when we're doing on-line discussions you tend to see his name a lot more.

*What about the actual quality of work?*

I don't think the quality is always as good as people who don't communicate as much. I personally think that someone who actually gives you the right messages rather than a lot of messages is the person that I would go for as someone who is better for the group". (Interview 36, 383:407)

## **5.2 PARTICIPATION: INTERVENING CONDITIONS**

A number of conditions were identified as factors intervening to either facilitate or constrain the on-line group participation. They are presented here along with their implications in Figure 5.2.



*Figure 5.2- Participation Intervening Conditions*

### 5.2.1 PARTICIPATION: FAMILIARITY WITH COMPUTERS

Interviewees reported, as one of the conditions, which affected participation, someone's familiarity with the computer situation. This is actually a code with a great number of quotations attached to it. The code was placed within the intervening conditions as its existence or not can either facilitate or constrain participation in the group. Interviewees reported that the degree of someone's familiarity with computers affects his/her participation. Prior experience in computer situations does make a difference in someone's participation. When a group member is familiar with computers, they seem to feel more comfortable in the on-line group. Using the computer (under the condition that the person is familiar with it) can be compared with using the television.

"Yes it would do - if someone wasn't familiar with computers or hadn't used them before, then they would probably find it harder trying to say through a keyboard typing everything in, then press enter and watch what somebody else is saying. Whereas, for somebody that has a lot of experience with them, it will be just like using a TV to them or something that everyone takes for granted as using easily, so they would probably find it easier communicating on-line than somebody who hasn't used it just because they are more familiar and more used to using that technology".  
(Interview 30, 375:381)

Therefore, if group members are more comfortable with using computers they will report having more chances to participate in the group.

"I don't think that familiarity with the software

would make people participate more or take the lead. I think it is more familiarity with the hardware because if you are familiar with one word processing package then you feel fairly confident using other things and you can adapt in using new packages that you never used before. Then, there will be lots of similarities and you won't feel so scared, but if you haven't used a computer before you will be scared of pushing buttons in case you break it. This is why I don't try to teach my parents how to use a computer.

*So, is familiarity with computers in general making any difference?*

Yes, because you feel more comfortable.

(Interview 21, 371:381)

"Obviously because the more experienced you are the more you want to participate, I suppose because you feel more comfortable with that".

(Interview 23, 182:184)

On the contrary, group members who do not enjoy great familiarity with computers feel left out of the group.

"There were also a couple of people who did felt a bit sort of left out in using the facilities because they weren't forward enough about the use of these environments, they had fears of using it". (Interview 09, 176:183)

Or even reluctant to participate.

"Yes if you know what you're doing you're going to get involved more in it, if you haven't used a computer for years and you're not quite sure what's going on you are a bit more reluctant to do things".

(Interview 37, 178:182)

## **5.2.2 PARTICIPATION: FAMILIARITY WITH SOFTWARE**

Often in their interviews group participants appeared to make a comparison between the codes *Familiarity with Computers* and *Familiarity with the Software*. Therefore, we tried to compare the quotations linked with the two codes to reveal any possible relations. The comparison showed that familiarity with the software was not considered to be as essential for the participation in the group as familiarity with computers was. Nevertheless, it was still considered to be a factor influencing participation, although familiarity with computers was proved to be more important.

"I think that familiarity with computers makes a difference in the way you approach things in the on-line group.

For instance, I didn't have any experience of computers as some other members of my group, so I had so many questions about what is everything, but the other members of the group they already know what everything was, and they just enjoyed. Familiarity with the specific software we are using every time makes a difference as well on the participation,



but it is not that essential as familiarity with computers, because the software we are using is very easy to use and you can find your way around them quite easily". (Interview 40, 186:195)

However, interviewees reported a number of reasons why familiarity with the software is not considered to be essential. Nowadays, newly developed software is considered to be *user-friendly*, even for novice users. Therefore, familiarity with the specific software is not an impediment to the participation in the on-line environment. It is relatively easy for the group members to introduce themselves to new software and "find their way around it".

"I think that this is only for the first time or at least for the first few times, if two people starting to use a special software for collaborating the one who knows more about computers will participate more the first few times, but after a while the other one will be able to participate as well. This is happening because, computer nowadays and software are pretty easy to use, it is very simple to find your way around, and after a couple of days you participate as much as the others". (Interview 39, 198:203)

Consequently, familiarity with the software still affects participation in the on-line group but loses its importance due to the user-friendliness of the newly developed software.

"Familiarity with the specific software we are using every time makes a difference as well on the participation, but it is not that essential as familiarity with computers, because the software we are using is very easy to use and you can find your way around them quite easily". (Interview 40, 190:195)

Additionally, new users do not need to fully use specific software products in order to be able to communicate. The user friendliness of software designed for such purposes does not require the group members to be experts in it. The understanding of some basic functions or commands of the software is adequate to allow group members to communicate.

"Obviously you need to know how to use the basic software and things like that. But I think once you've got the grasp of the basic stuff there in just kind of group work, communication stuff, I don't think it matters too much as to whether someone's an expert or not. As long as you know how to do all the basic functions and things, I don't think it makes too much difference to be honest. It's not that difficult, actually once you know how to do it and send it and set your lists up and stuff like this, it's fairly easy to do". (Interview 36, 289:294)

However, practising with the software improves participants' skills. Interviewees reported facing problems using new software only on the first few occasions.

"Probably would in the first couple of times you use it but after a while you do get used to it properly but it's threatening the first time when you're getting to know the commands. Like when we all started no-one really knew what to do, we were worried but we started it. Now you're a bit more familiar with it you can sort of get a couple of

windows up at the same time and things like that".  
(Interview 37, 184:190)

However, even during the first interactions they were able to use at least the basic commands. After first experimenting with the new software participants were not concerned about it any more. Eventually, its use would become "part of their communication", "taken for granted", just like "picking up the telephone".

"Even with most simplest things like e-mail, I first used e-mail this year, it's a very simple concept but using it for the first time it all seems a bit weird, but it's just a case of using it for a few times and then you take it for granted it's all part of your communication like picking up the telephone". (Interview 35, 171:174)

### 5.2.3 PARTICIPATION: FAMILIARITY WITH THE SUBJECT

Another factor found and placed among the conditions influencing participation was *Familiarity with the Subject*. *Familiarity with the Subject* was reported to play a noticeable role in the participation process. It seems that prior experience with the subject helped the group participants to contribute more ideas.

"If someone is familiar with the subject has obviously more ideas to contribute". (Interview 40, 197:199)

Interviewees revealed that someone's acquaintance with the subject under investigation affected their participation in the group. It is quite important to note that trying to check and test the codes *Familiarity with the Subject* against the code *Enhanced Participation*, they were found to co-exist in every case.

"It definitely helps if you know what you're talking about really, if you've done it before it definitely makes things easier. One person in the group to do different module, if he's done it before he's likely to participate a lot more than people who it's the first time they've seen it really". (Interview 37, 192:197)

"If you know the subject you are dealing with you are more likely to participate in the group". (Interview 39, 205:208)

Additionally, prior knowledge of the subject enhances the outcome of the on-line conversation. If group members are familiar with the topic then it is more likely that they would contact a better conversation with their peers. On the contrary, lack of familiarity with the subject might lead to limited participation.

"I suppose you would get a better conversation with people if people have got a general knowledge about that. If you ask people on-line to chat about East Enders last night and you knew that everyone had watched East Enders, you're going to get a far better conversation than if you say "what do you think about ..." and throw out something that they've never

heard before. People who are not very familiar with the subject they would be afraid to participate". (Interview 41, 233:239)

### 5.2.4 PARTICIPATION: TYPING SKILLS

The code *Typing Skills* was linked to a great number of quotations. All quotations referring to the importance of the typing skills during the group interaction were included. After conducting the first few interviews, it became apparent that there was an obvious connection between typing skills and group member participation. The importance of the specific code for the on-line interaction was underlined by the number of times the code would appear in each interview. There were some cases where the interviewee kept referring back to the need for improvement of his/her typing skills. For codes linked with the code of the Typing Skills see next Figure 5.3.

Closer attention to the quotations linked to the typing skills in connection to participation, and the performance of a number of queries with the use of the Query Tool in ATLAS.ti software led to some interesting observations. It was revealed that typing skills are particularly important during the *synchronous mode* of on-line group communication, when group participants need to be able to respond instantly to their peers. Therefore, the ability to keep up with the rest of the group requires the employment of fast typing skills.

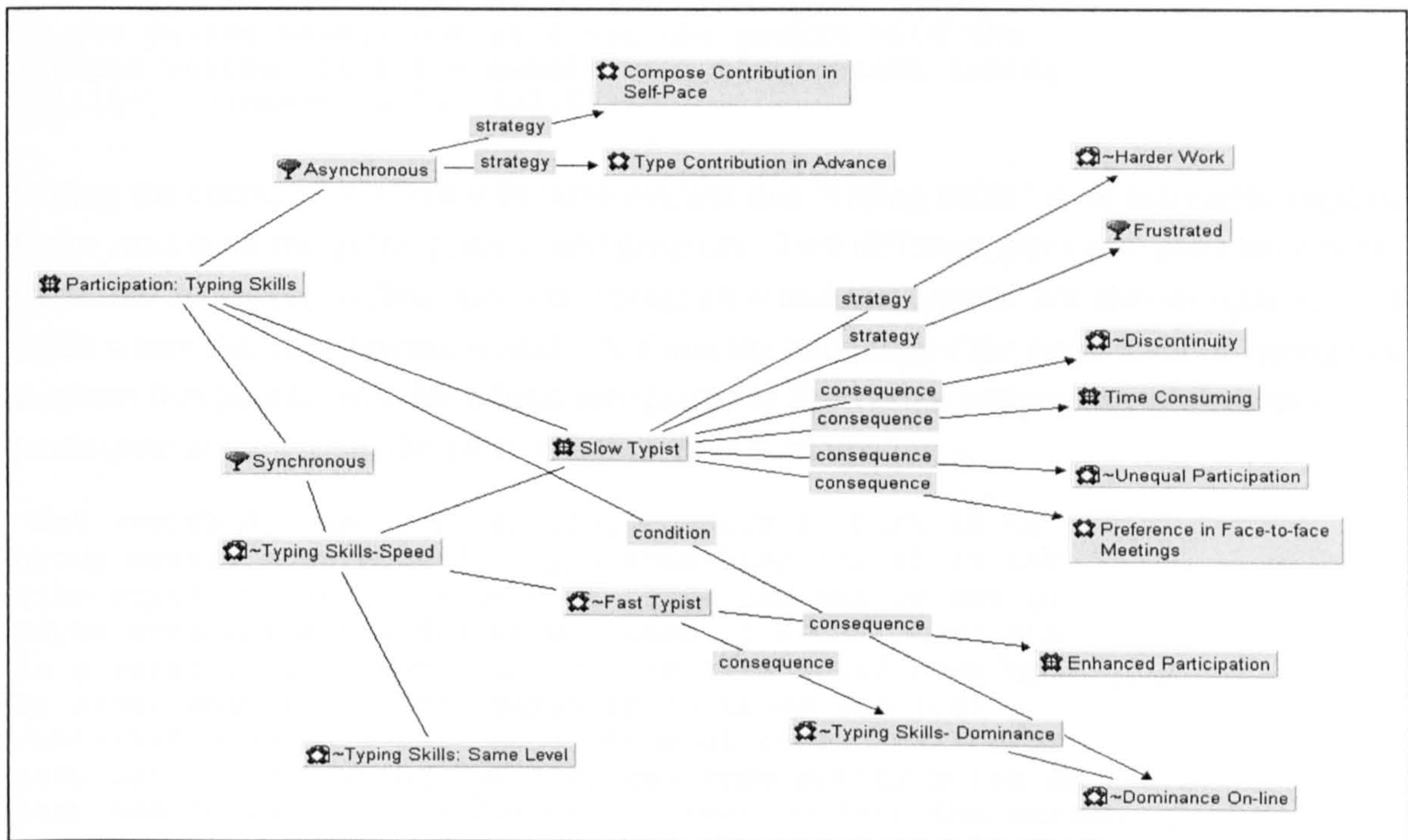


Figure 5.3- Participation- Typing Skills

In the following quotation the interviewee connects spontaneity in the on-line communication to the use of a synchronous mode. "Good" (meaning "fast" typing skills) are the medium helping to establish spontaneity.

"OK, let's talk about people I do know when I IRC with them it is very spontaneous especially if I know them very well, you just type down what you think, because I am quite good in typing so I can just type as it comes and I like seeing the words on-line actually, it is like making your thoughts more clear, it is like actually visualising it on screen which is what it is".  
(Interview 11, 165:169)

It is interesting to see how the next interviewee connects speed in typing skills with the dominance of a loud person in a face-to-face group.

"We choose the asynchronous method because we thought we could think about our stuff. I think the asynchronous method it doesn't really matter so much whether you can type or not because you have time to correct it, think about it whatever. But if it was synchronous, with real time then basically yes, it does matter. I've had a couple of times when I've tried to have a synchronous chat with someone in the States, and I can type but they can touch type, and you can't get a word in edgeways. And it's like, I've just got to sit here and watch. I guess it's similar to when people are in a meeting in here, the loudest people get their voices heard, and the quietest people think, I can't wait to get out of here. The same thing's happening on the online thing, but it's not the people with the loudest voices, it's the people with the fastest typing skills". (Interview 25, 523:532)

During the course of analysis it became evident that "typing skills" is an extremely important factor mediating the group process and progress. Two different types of typists have been identified according to their speed in typing: *slow* and *fast* typists. We also recognised some cases where the interviewees would talk about the handling of the same level of typing skills. It seems that people, who have been recognised as *fast typists* enjoyed more chances to participate in the group, therefore enhance their participation.

"Not everybody was participating equally I think in my group nearly everybody did type something but it is not like equal amounts. I know that there was one or two or maybe even three besides me who used to e-mail more and in greater length, and then no- one else would turn up. My group wasn't too bad. Maybe it is those who feel comfortable using e-mail as a means of communication or they don't mind typing, or they can type pretty quick so they can actually get a lot of information onto the screen and send it. Whereas some people if they type slowly or they are not too good with computers they might find it quite difficult". (Interview 11, 220:227)

"I think actually that that helps because obviously people are quick, you think of an idea and you know somebody else

may be quicker than you and they quickly jump in and they think, they put their idea in. When you ask a question and everybody puts in their view but sometimes people you think of something and then somebody quickly has put something before you typed in before you so you can read it and you forget the idea sometimes and you realise you need to modify what you initially thought". (Interview 38, 189:196)

Additionally, typing skills assisted group participants to *express dominance* in the on-line group. As presented in the next quotation, it is the combination of typing skills and computer literacy that helped group members to become dominant on-line.

"The person that could type well probably will be the dominant one, because some people finding it hard to type, you know they are not used to keyboard or they are scared of the packages and you get some nervous people thinking if I do this I will crash this and they are not very computer literate, whereas the ones who are computer literate they are the ones who seem to be able to manage the group. The ones who have used the computers for several years are the ones who are more confident". (Interview 03, 225:231)

"Yes, I find it harder working on-line, like last year when we were working in groups and we used Usenet groups everybody else could type faster than I could, so they were like dominating the conversation a lot more, I suppose if I told them to slow down the situation could be better, but you cannot really do that. Face-to-face I feel that I am more involved in it.

So, do you think that it has to do with your typing skills then?  
Yes.

OK, so what if you improve your typing skills, would you still feel differently?

Yes, because you cannot see what the other people are doing and their real reaction, you can only tell what they are thinking by what they type, rather than their body language".

(Interview 20, 99:113)

However, among the quotations linked with the *Typing Skills* there were some cases where interviewees reported typing skills not playing a vital role in the participation process. In fact, a closer look at the specific quotations revealed that in those cases group members were more or less at the *same level of typing skills*. Under the condition that all group members acquire the same level of typing skills, group interaction is not affected, as everyone's input would be typed at the same speed.

"I suppose that typing skills would make a very small difference, but not a lot because most people of my age are happy using computers but I don't know anybody that can type very well. Everyone's like that, but it doesn't really matter". (Interview 31, 170:173)

"I mean I suppose there are the people who can't type as quickly, especially on the Chat Group, and I've found it as well that you can often get completely side-tracked. So, someone would write a question "oh, this is what I think. What do you think?" and then if you start typing away and

you're typing and you know a big long response, by the time you've finished it and press enter for it to be sent another like five points have come up which makes yours completely irrelevant. So I found I had to start writing like one sentence and then pressing "enter" and then sort of dot, dot, dot at the end and pressing enter. Writing another sentence pressing enter. So that it all came down kind of as I typed it. So, I think that if the group members would be at the same level of typing skills that would be better, we would be more able to follow the conversation". (Interview 41, 199:210)

In the previous quotation, the interviewee noticed that typing skills did not make a huge difference in participation, as group participants were approximately at the same level of typing speed. However, what happened in the cases where group participants did not possess the same level of typing skills?

Another type of typist was identified and named as the *Slow Typist*. Data from the interviewees revealed that a slow typist had to face a number of difficulties. There were some cases where the interviewees noticed that typing skills might not have affected participation resulting in fewer contributions. However, a group participant with poor typing skills feel that they have to *work harder* in order to be able to keep up with the rest of the group.

"Do you think that typing skills have to do with participation?  
I think in most cases it would but I'm very slow typist.  
I'm very self-conscious about it particularly because everyone in my group seems to work with computers, and I've only started using them this year and haven't picked up yet.  
Does this thing make you participate less than the others?  
I don't think it does but I feel I have to work harder to keep up with everyone else". (Interview 35, 159:167)

Therefore, group members with poor typing skills find it harder to participate in the group. On the other hand, group members with fast typing skills dominate the on-line conversation.

"I find it harder working on-line, like last year when we were working in groups and we used Usenet groups everybody else could type faster than I could, so they were like dominating the conversation a lot more, I suppose if I told them to slow down the situation could be better, but you cannot really do that. Face-to-face I feel that I am more involved in it". (Interview 20, 99:105)

Additionally, poor typing skills can lead to a number of unpleasant consequences such as frustration, time loss, and discontinuity particularly linked with synchronous communication. But most importantly, poor typing skills can result in unequal participation among the group members. On-line interaction was often characterised as "tedious", if the condition of the typing skills has not been met. A slow typist can feel quite uncomfortable with the whole on-line situation and therefore *frustrated*, as he/she will be left behind in the on-line conversation.

"For a start I can't type as fast as other people, so when I'm having a discussion with someone they are like five minutes ahead of me. I don't feel that comfortable, I must admit when I'm on-line. I'm so slow but if I was a faster

typist I'd be very comfortable with. It can be good especially when you're just getting to know a group". (Interview 35, 107:113)

The comparison with face-to-face discussion is once again inevitable. Thus, for certain group members, typing in the on-line group resembles talking in a face-to-face situation, meaning that they do not have to make an effort. However, for others it just causes frustration.

"It could be just the technical thing, I mean that some people don't actually like computers and that's just a fact of life, some people might think it takes them too long, it takes a long time to type what easily just could be said. If you don't have a problem of typing you can just type as you think which what I do. But some people if they are not good at typing as well then they just trying to type a few simple sentences, that if they were face-to-face they just say it, so they probably they might be frustrated". (Interview 11, 231:236)

Poor typing skills do not only cause frustration, their lack can also prove to be very *time consuming*.

"I think that if somebody could type as fast as he/she talks then on-line would be real successful. So, it takes double time whereas when you talking to someone you just do that". (Interview 03, 257:259)

"It could be just the technical thing, I mean that some people don't actually like computers and that's just a fact of life, some people might think it takes them too long, it takes a long time to type what easily just could be said. If you don't have a problem of typing you can just type as you think which what I do". (Interview 11, 231:234)

Another parameter also connected and placed among the consequences of *Typing Skills* is the code labelled *Discontinuity*. In the on-line group communication the link among the group participants is the computer screen. Therefore, group participants with poor typing skills run the risk of becoming left behind, as the computer screen moves on, making it impossible for them to participate. As a result, group participants with poor typing skills are unable to follow the on-line conversation due to their typing skills, and they eventually lose track of what is going on in the group. There is, in other words, a discontinuity in comparison with the way a face-to-face conversation normally runs.

"I mean I suppose there are the people who can't type as quickly, especially on the Chat Group, and I've found it as well that you can often get completely side-tracked. So someone would write a question "oh, this is what I think. What do you think?" and then if you start typing away and you're typing and you know a big long response, by the time you've finished it and press enter for it to be sent another like five points have come up which makes yours completely irrelevant. So I found I had to start writing like one sentence and then pressing "enter" and then sort of dot, dot, dot at the end and pressing enter. Writing

another sentence pressing enter. So, that it all came down kind of as I typed it. So, I think that if the group members would be at the same level of typing skills that would be better, we would be more able to follow the conversation". (Interview 41, 200:210)

"I think so because that was one of the things I was a bit worried about because I'm not very good at typing at all. I am not very quick. And when I was on my computer and the other group were on their computer there was a real big time lag between them receiving my messages and me starting to write them. I'd find that I'd be writing something and then they'd reply to a message and it's like my message is no longer relevant so I've got to delete it and start writing another message and it takes me ages". (Interview 44, 258:264)

Based on all the above, typing skills were marked as one of the most important factors affecting on-line participation. As a result of all the previously mentioned elements, group members with weak typing skills will end up *not having an equal share of participation* in the on-line group.

"Not everybody was participating equally I think in my group nearly everybody did type something but it is not like equal amounts. I know that there was one or two or maybe even three besides me who used to e-mail more and in greater length, and then no-one else would turn up. My group wasn't too bad. Maybe it is those who feel comfortable using e-mail as a means of communication or they don't mind typing, or they can type pretty quick so they can actually get a lot of information onto the screen and send it. Whereas some people if they are type slowly or they are not too good with computers they might find it quite difficult". (Interview 11, 220:227)

Based on the above reasoning slow typists showed *a preference for face-to-face communication*.

"I prefer being face-to-face but if I could improve my typing I wouldn't see much difference of being face-to-face, although you cannot see their reactions on-line as well as face-to-face". (Interview 20, 139:141)

One of the explanations offered for the preference for face-to-face interaction dealt with the constrictions on participation due to slow typing skills. Group members with poor typing skills were unable to absorb and handle the on-line information.

"I prefer to work face-to-face because I cannot type this fast. I suppose I did participate, but not as much as other people because I couldn't type as fast as other people and I couldn't absorb the information as fast". (Interview 20, 284:286)

It is of note that the interviewee in the next quotation compares on-line to face-to-face interaction, under the condition that they possess a fast speed in typing.

"If someone types fasts it is the same as he is talking,



for me I type slower than I talk that is why my contribution in the face-to-face group is higher than on-line. So, in the face-to-face situation I would say more on-line but when I am on-line I would express myself better as I explained before". (Interview 39, 224:229)

However, the fact that some interviewees were willing to compare face-to-face with on-line interaction based on the same standards, if the condition of fast typing skills was met it is quite encouraging. After all, typing skills are an element group participants can work upon and improve.

"I prefer to work face-to-face because I cannot type this fast. I suppose I did participate but not as much as other people because I could not type as fast as other people and I couldn't absorb the information as fast. *The typing still however is definitely something that you can improve. Do you think that if you improve your typing skills it is going to work better for you?* Yes but it is got to be similar kind of standards, so no-one person can dominate it". (Interview 20, 284:291)

Interviewees talked about both synchronous and *asynchronous* mode of communication in the group. Data revealed that typing skills were not found to be an important parameter during asynchronous communication.

"It is not the typing skills who would make a person dominant on-line it is the ideas this person is expressing, like if you believe that you have some good ideas on a particular problem and you are willing to dominate on-line although your typing speed is not very good it doesn't matter that much. Because if something is being sent to you, you can take all your time, think about what you want to say and then type it at your own time and speed. So, for me if you have some interesting ideas, and the will to manage the topics, to manage other people, it is only a matter of using more time to type something". (Interview 22, 360:366)

In the above quotation the interviewee addresses the time required to type in an on-line contribution. Obviously, the interviewee has in mind the case of asynchronous mode of on-line communication. Time here can be used as the factor that would allow the participant to compose their contribution at their own pace.

"The first you might feel like you cannot catch up because the others are typing more quick. However, the synchronous situation is not only happening once, it will happen certain times. But you can be prepared, you can type whatever you want to say and save it to a disk and when you chat you just copy your disk and send it". (Interview 22, 368:373)

It is becoming clear from the previous quotation that typing skills are mostly connected to the synchronous mode of on-line communication, they are more essential there. The above quotation even provides a solution for typing skills speed and synchronous mode of communication. Group participants can be partly prepared for on-line interaction, as they can

type their contribution in advance, save it and then use it. Choosing then one type of on-line communication over the other might be a matter of personal preference and might be used accordingly to accommodate the group's needs.

"We chose the asynchronous method because we thought we could think about our stuff. I think the asynchronous method it doesn't really matter so much whether you can type or not because you have time to correct it, think about it whatever. But if it was synchronous, with real time then basically yes, it does matter. I've had a couple of times when I've tried to have a synchronous chat with someone in the States, and I can type but they can touch type, and you can't get a word in edgeways. And it's like, I've just got to sit here and watch. I guess it's similar to when people are in a meeting in here, the loudest people get their voices heard, and the quietest people think, I can't wait to get out of here. The same thing's happening on the on-line thing, but it's not the people with the loudest voices, it's the people with the fastest typing skills". (Interview 25, 523:532)

It is clear once again from the previous quotation that typing skills are connected mostly to the synchronous mode of communication. If you are in an asynchronous mode you do not really need extremely good typing skills, you have all the time you need to type in your contribution and put your message across to the members of the group.

### **5.2.5 GROUP SIZE**

The code named *Group Size* refers to the number of group members in the on-line group. It was created to include all the cases where interviewees talked about the possible effects of group size. The code was initially connected to the *Express* category as a condition intervening with the way group members expressed themselves in the group.

However, after testing the code against the participation category a new connection was revealed. The group size was found to be an intervening condition for the participation group of codes as the following quotations are showing.

"There were only three people in our group anyway there was anybody else to turn up, so it is pretty much the same because it was only the three of us so cannot really have just one person going away and then the expect from the others to form a group". (Interview 05, 154:156)

"Because there was only three of us in the group we used to participate the same, but if we had a larger group I told you it would be a couple of people who didn't really co-operate". (Interview 05, 187:191)

## 5.2.6 LEVEL OF INTEREST

Furthermore, quotations from the interviews showed participation being affected by the level of interest group participants displayed in the group. Participation seemed to be affected by the group members' personal interest in the group itself and in the topic being handled.

"You could tell that more people would participate. However, there were certain people that would dominate in it, and other people that would only read what the dominant people would put.

*Why do you think that people would participate more than the others?*

Some people might be more interested than the others. It depends on whether they wanted to participate I suppose and or whether they felt that they could or they should".

(Interview 20, 145:154)

Some data showed that the level of interest of part-time students was relatively low in comparison to that of full-time students.

"It never happened in the group for the group members to participate equally. I am not really sure what happened but it seems that there were some students from Greece and Portugal and they seemed to be part-time students and I think that this was probably the reason why they weren't participated as required". (Interview 24, 124:127)

## 5.2.7 GROUP ATTENDANCE

Some interviewees also reported participation being affected by the group members' attendance. It seemed that some of the group members managed to escape attendance for a few weeks.

"Not everybody was participating equally I think in my group nearly everybody did type something but it is not like equal amounts. I know that there was one or two or maybe even three besides me who used to e-mail more and in greater length, and then no- one else would turn up". (Interview 11, 220:224)

It also seems that on-line interaction provided more opportunities for a group member to escape attendance and therefore miss participation.

"Pretty much everybody was participating with one or two exceptions there, I guess it was easy to escape, you know if there wasn't OK meeting, you could telephone or send an e-mail or whatever, and it was quite easy for people to disappear for two or three weeks. So, from that point of view maybe the participation happened to fail compared to if you were face-to-face. Because if you are working face-to-face all the time you cannot miss the persons". (Interview 16, 147:155)

## 5.2.8 TECHNICAL PROBLEMS

Another intervening condition found to affect participation in the on-line group was coded under the name of *Technical Problems*. The technical problems that would constrain participation were mainly referred to as "hardware" or "software" problems, or in other words as system and software stability and reliability. Furthermore, another intervening condition found to affect participation in the on-line group was coded under the name of *Technical Problems* as presented in the next Figure 5.4.

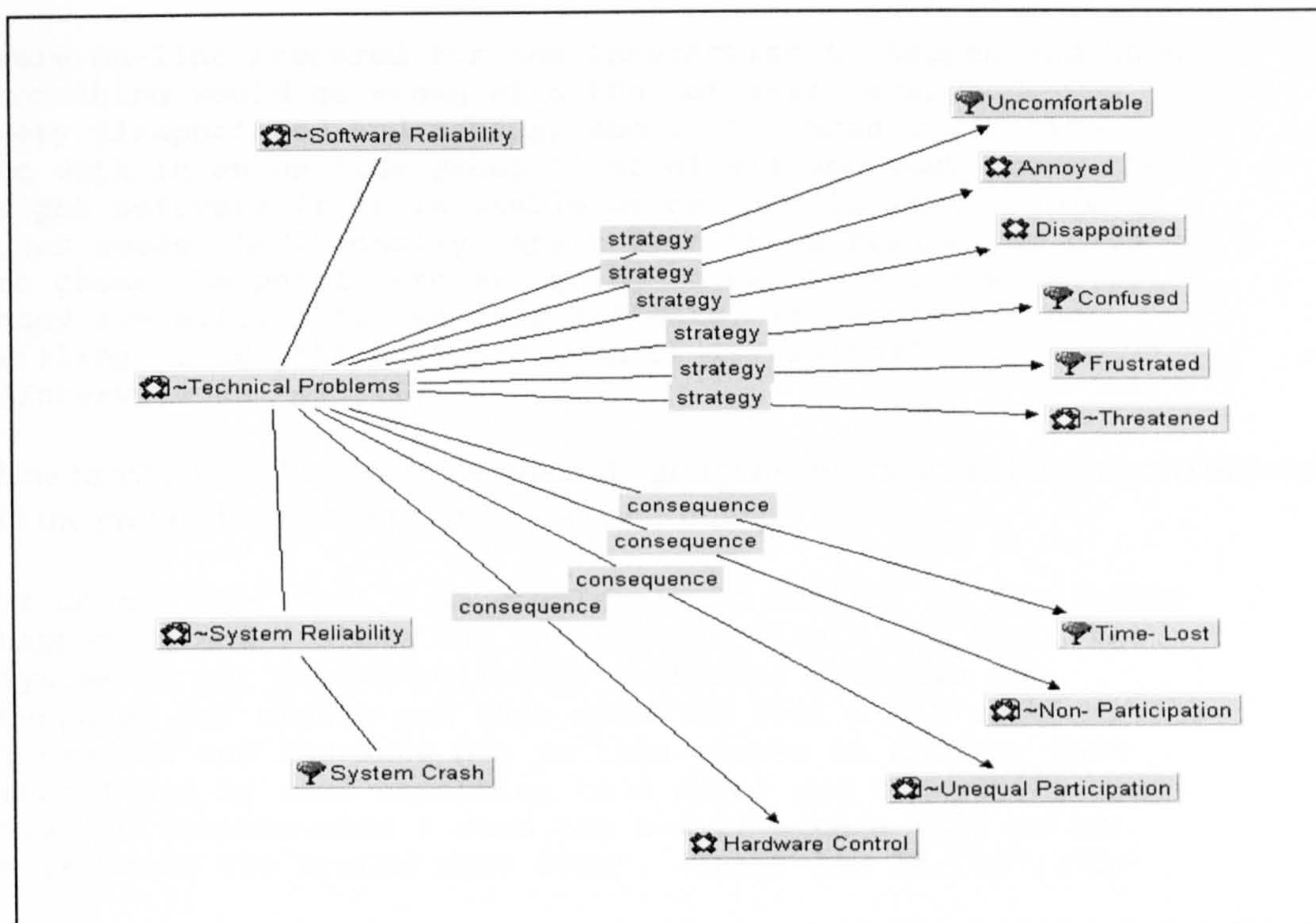
The technical problems that would constrain participation were mainly referred to as "hardware" or "software" problems, or in other words as system and software stability and reliability. Interviewees quite often complained about hardware stability. The unreliability of the system had an immediate result on the initiation of distress on group members whose messages failed to reach the rest of the group.

"The only thing that you do not feel comfortable about is the technology, you are worried that your message is not going to get through the other side. So, there is the problem of the reliability of the system, it can come down any time, so if you are using a system and you are worried if your message will get across then I don't think that it is a very good system, and then I think that it cannot be used". (Interview 24, 365:370)

Group members experienced system crashes that immediately affected their participation.

"The truth is that we had to face a few problems because the system was not reliable, when it should be, when we had our on-line meetings. We had a case when we wanted to publish something on the software for the other to see and then the system crashed, so we couldn't do anything". (Interview 29, 90:93)

The comment made by the next interviewee reflects his experience with system crashes. However, he seems to have come to terms with the situation. System crashes are considered to be something inevitable because of the number of people using the network.



*Figure 5.4- Participation- Technical Problems*

"Computers could be a bit quicker. But that's just the nature of the beast and we can't actually do anything about that. The computers here they do tend to crash a lot but, well that's just the network we're using and the actual ...I think that's the computers we're using and the fact that there's so many people using the network and stuff". (Interview 36, 944:947)

However, not only the hardware was unreliable. Interviewees also complained about software unreliability.

"I have to say first that the use of the specific software in order to achieve the aims of the course itself is very important, and letting the people know how to use the specific software, the use of the software on how to implement the specific course. I have finished my degree in Singapore for two and a half years and I have worked in a business environment as a system analyst, so I was used in communicating the overseas customers, I have used this kind of software before. But the particular software we used is not a very stable software anyway". (Interview 22, 50:56)

The next interviewee admits losing control over the online group situation due to software unreliability. Therefore, he points out how important it is for the on-line course to use software that is stable, and suitable to the group needs.

"I think that a few times I lost the control especially because of the software that wasn't very reliable. So, I am happy from the group situation from on point of view, but I wasn't very happy because of the software. So, when we all

were on-line prepared for the interaction to happen and then something would go wrong with the software, everybody was very disappointed and unhappy about it. When you decide to work in an on-line group first of all you must chose the right software if it is stable or not and if it suitable to your needs. Additionally, apart from the software you have to chose the people who are going to use this software, if they are willing to use this software. If people are not willing to use the software then it is useless".

(Interview 22, 419:427)

**Due to system and software unreliability group members did not manage to maintain control in the group. Group members felt uncomfortable:**

"I do not feel that I am completely in control of the things happening and I blame the environment itself for that, the system is not always reliable, technical problems can happened any minute and that makes me feel a bit uncomfortable. There was one instance not in this course in another case when I had to send something to a tutor and everything went missing because when I send the e-mail with a file as an attachment the system went down". (Interview 29, 347:352)

**Also annoyed:**

"Things like the server that would go down or something - on some of the computers it wasn't there or people didn't know how to put it on. If everyone was told that at the beginning then a lot of the time that would save a few of the problems. It's probably more trouble shooting and things like that where a lot of the problems are - getting on- line. Yes I think sometimes when the server crashed that was quite annoying because you were getting right into the discussion and then it just went down and nobody could do anything - that was quite annoying. Everyone was a bit peeved off with that - if it was a lot more reliable and you could get on first time and things, then it would be much better".

(Interview 30, 576:585)

**Disappointed:**

"I think that a few times I lost the control especially because of the software that wasn't very reliable. So, I am happy from the group situation from on point of view, but I wasn't very happy because of the software. So, when we all were on-line prepared for the interaction to happen and then something would go wrong with the software, everybody was very disappointed and unhappy about it.

*Do you think that it has to do only with the design of the software or there are other reasons behind that as well?*

When you decide to work in an on-line group first of all you must chose the right software if it is stable or not and if it suitable to your needs. Additionally, apart from the software you have to choose the people who are going to use this software, if they are willing to use this software. If people are not willing to use the software then it is useless".

(Interview 22, 419:433)

### Confused:

"It is ultimately the hardware that it is in control, if you trying to make a point it can take ages for a message to be send, and by then someone would send another point, and it just gets completely confused, all the messages seem to be out of place. So, it could a bit of time to fill it all out to the proper order, so you just don't feel in control at all in that way". (Interview 23, 305:309)

"I cannot say if everyone is participating the same because of the computer problems that we experience, sometimes it is taking quite a long time to get into the system, that is not always reliable, sometimes when I go in fast then there is nobody there and I do not know what to do. Or the other day I received an e-mail I was reading my e-mail and then accidentally I closed the computer and when I got back everyone was doing a chat I was quite confused on what was going on". (Interview 40, 170:177)

### Even frustrated:

"Yeah it's to do with the computers, every time they crashed it's just so frustrating when you've taken like half and hour to log on and then it all crashes. So that was ... that makes you a bit apprehensive about trying again, when it feels not from your own fault. Also with the IRC there was a great time lag and like I said it made it quite confusing and I wasn't all that keen to use it again because, I don't know, the e-mail seemed to have just as much of a time lag as the actual sort of interactive room. I mean it's got to be good in order for people to want to use it and to be confident to use it". (Interview 44, 469:475)

### Additionally, technical problems resulted in losing valuable amounts of time in the group.

"If the system is not reliable then eventually they will stop using it altogether, and say well it's easier and less hassle to just meet up somewhere, rather than trying to do it on-line. By the time you're messing about and trying to sort it out, you've wasted that much time already before you can actually start getting to the task. The liability of the system I think is pretty important. If it was not reliable then you'd be wasting a lot of time trying to get on line - which we still are really. Everyone says it takes about 45 minutes to 1 hour for everyone to get on-line, so it's a good job we have a 2 hour session. If we could get on first thing and we have that extra hour then it would be a lot better and lot more work we could get done in that time. But that factor is the main one". (Interview 30, 484:495)

"I cannot say if everyone is participating the same because of the computer problems that we experience, sometimes it is taking quite a long time to get into the system, that is not always reliable, sometimes when I go in fast then there is nobody there and I do not know what to do. Or the other day I received an e-mail I was reading my e-mail and then accidentally I closed the computer and when I got back everyone was doing a chat I was quite confused on what was

going on". (Interview 40, 170:177)

And eventually affected participation. Therefore, group members were either not able to participate in the group.

"If it's not reliable then eventually they'll stop using it altogether, and say well it's easier and less hassle to just meet up somewhere, rather than trying to do it on-line. By the time you're messing about and trying to sort it out, you've wasted that much time already before you can actually start getting to the task. Basically they're a liability I think as a system. If it wasn't reliable then you'd be wasting a lot of time trying to get on line - which we still are really. Everyone says it takes about 45 minutes to 1 hour for everyone to get on-line, so it's a good job we have a 2 hour session. If we could get on first thing and we have that extra hour then it would be a lot better and lot more work we could get done in that time. But that factor is the main one, they're a reliability to the system itself". (Interview 30, 484:494)

Or would not enjoy equal amounts of participation.

"It's difficult to say because sometimes people have problems like, you know, understanding how it works so they'll ... I mean like one time I ... when I had the problem with the computer crashing I wasn't logged on and then another time someone didn't ... couldn't get the computer working or didn't understand how to do it. But when we're all on-line, yeah we all participate the same". (Interview 41, 191:197)

## **5.3 PARTICIPATION: ACTION/INTERACTION STRATEGIES**

The data linked with the action/interaction strategies in the *Participation* category is mainly presented in two blocks. As the following figure indicates, the first one concerns data focusing on the way group members from the opposite gender acted in the on-line group. The second group concerns the way personality factors influenced participation.

### **5.3.1 PARTICIPATION: GENDER**

One of the questions asked during the interviews was concerned with gender participation. Interviewees were asked if they believed that the gender of the group participants affected participation in any possible way. By asking this question our underlying intention was to check interviewees' insights into participation of the opposite gender. Interviewees reported that gender did not play a vital role in participation. The main explanation given for such an attitude was linked to the difficulty of identification of a group member's gender. It emerged from the data that theoretically the on-line environment that smoothes out the differences



between the two genders. Especially in cases where people are using nicknames, their identity cannot be easily distinguished and therefore identified.

"I'm not sure really - especially if you're using nicknames or something like that you wouldn't be able to tell if it is a male or a female. I don't know really".  
(Interview 37, 199:203)

Additionally, due to the lack of visual contact the gender of individual group members was not identifiable. The next interviewee remarks on the use of language. Group members can possibly distinguish the sender's age by the use of language. However, the identification of gender is more difficult.

"No, no it doesn't, not in an on-line environment because everyone's equal. I mean, say for example if you were in an office based environment where everyone's log in is just like a number like 1, 2, 3, 4, 1 2, 3, 4, 5, you'd have no idea what gender the person was unless you'd actually met them, you knew who they were. I don't think you'd easily tell by the language, or you might be able to tell by the language they were using as to how old they were but I think you'd find it probably hard to distinguish what sex they were. Because obviously even in the written word people of different generations do tend to express themselves differently. But I think you've got to be very clever and know a lot about communication to actually be able to assess". (Interview 36, 353:362)

"Does gender makes a difference in the participation?  
It shouldn't do - our group's all male so I don't know - I don't think it would make a difference, not with people having my age, maybe with older people it might".  
(Interview 31, 207:209)

Therefore, in the majority of cases interviewees stated that gender does not play a particularly important role in on-line group participation.

*"Do you think that participation in the group has to do with the gender (male/female participation)?*  
I don't think that gender makes a difference in the participation". (Interview 40, 217:220)

Gender participation being an insignificant factor will result in equal participation in the group.

"On on-line everyone's equal, aren't they? From what I've used everyone contributes the same on-line, but it's face to face where more dominating people put their views across more". (Interview 34, 184:186)

Interviewees supplied more data, which gave the opportunity for a more *personalised viewpoint* to be established. One *female* participant commented:

"They tend to be shy ones, people who are quite shy and the other ones who would participate face-to-face very

much, then normally tends to be one or two dominant leaders. Then it sort of gets better but you turn to find that certain people will e-mail certain people, because Jo and I we were the only girls Jo would e-mail me and I would e-mail her and the boys would e-mail each other and then we get together the last minute and it was done like that, it was almost like we had split in two different groups rather than doing it the other way". (Interview 17, 206:212)

As the above female interviewee reported girls tended to form a second group within the existing group. The same interviewee continued by saying that females need face-to-face interaction as well as on-line, maybe more than males do. The interviewee puts emphasis on the female need to establish relationships within the group, and also meet socially with their peers.

"Face-to-face everybody is more polite and they try to get along much better but you tend to find that the group splits and you are more I wouldn't say isolated, but the girls and the boys split I don't know why but that happened to our group, it was very much like they went away and they did their thing and we did our thing and there was more participation on the girl's side than the boy's because the girls in all the groups they tend to meet at the weekends, go for a drink together to talk it over and the boys went home did it on their own, went out with our friends, came back put it together rather than trying to sort it out. I tend to find that girls tend to do it more socially". (Interview 17, 239:246)

Gender participation was also discussed in the on-line group from a male point of view. There were a few cases where male interviewees would report females not participating as much in a face-to-face group situation. The main cause leading to such an attitude was reported as embarrassment. It seemed that female participants were too embarrassed to expose themselves in the face-to-face group. On the contrary, embarrassment did not seem to characterise male participants in the face-to-face interaction.

"No, not everyone was participating equally, we had a girl in the group who was very quiet face-to-face but on-line she was far participating much more.  
*What was the reason for that?*  
I don't know, embarrassment maybe, not really embarrassment but she just had a less authoritative character". (Interview 21, 194:202)

"This is difficult question actually, my experience says that men won't participate more than the women in the on-line environment. But then again it depends, I think that men they are not afraid of expressing themselves, they are not afraid to be exposed, women sometimes they are ashamed to express themselves because they do not want to look stupid or something, and sometimes that makes them to participate less than the males". (Interview 39, 215:222)

However, as one of the interviewees remarked, gender issues in both on-line and face-to-face communication modes have been misunderstood. Above all the most important factor in both modes is communication ability. Thus, communication ability is not a gender characteristic, it is more a personality than a gender attitude.

"Yeah it's more to do with the actual personality and how you can interact with people both face-to-face and on-line. I think the gender issue is one that's misunderstood by a lot of people. They tend to view it as to how well people can get on and do their jobs and things. I think the key element is being able to communicate and get on with people. In any job, if you can't communicate and get on with people and interact socially with people and get on with people at all different levels and social backgrounds it's a waste of time being there in my eyes". (Interview 36, 373:379)

However, it has to be pointed out that interviewees reported signs of *male domination*, in connection with *face-to-face group situation*, commenting at the same time that this was not a typical male attitude during on-line interaction.

"If it was a group with boys which my group basically was, on-line was better because they tended to dominate when we were face-to-face but when you are on-line they didn't know who you were because they never met me they never met Jo and they treated us the same. Although when they sort of met you it was different, but if it is a group of girls it is better face-to-face because everybody is treated the same but on-line I turn to find that you chat". (Interview 17, 123:128)

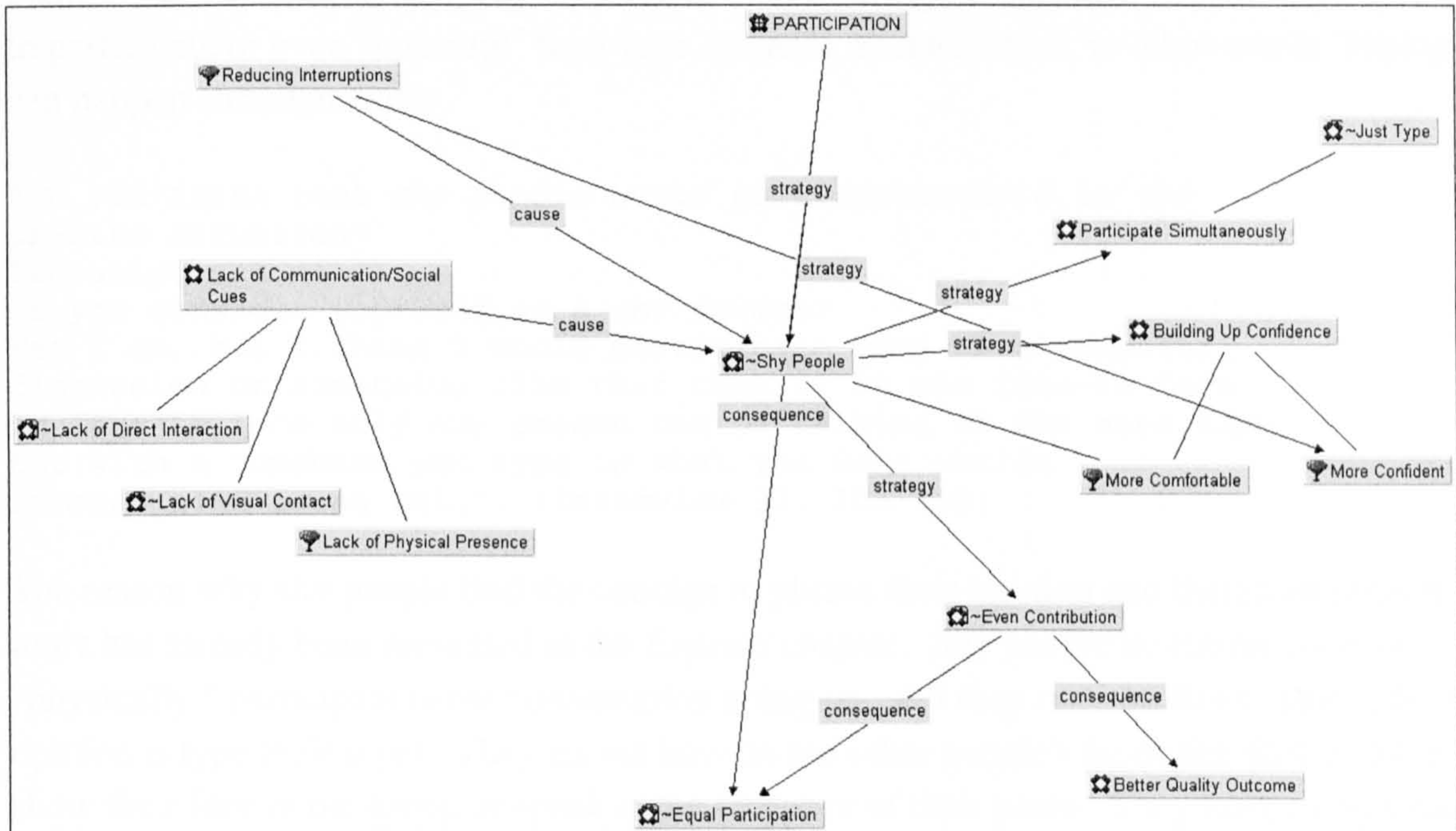
"I think this is quite good actually, there is a lot of differences you know as in gender, and I am particular sensitive in these things because my girlfriend is doing psychology and sociology, so if I interrupt her she notices, she would say look this is a typical male reaction. But you don't get that on the Internet". (Interview 21, 166:172)

### **5.3.2 PERSONALITY IN THE ON-LINE GROUP ENVIRONMENT**

The personality code was tested against the participation category in an attempt to establish some of the factors affecting both personality and participation in the on-line group. Personality was a general term used to describe two different types of group members' attitudes: a) dominant people and b) shy people. A number of quotations were found to prove and define the connection between the two family codes. Data revealed that personality is an important factor affecting participation in the on-line group. However, it needs to be noticed that personality was mostly linked with face-to-face participation, where it seemed to have played a significant role, as dominant personalities have more chance to exercise their dominance.

## SHY PEOPLE

It was shown in the *Expression* category that group members who consider themselves as shy seem to feel more comfortable expressing themselves on-line. Therefore, it was considered that it should be checked how shy people felt participating in the on-line environment, although it was already obvious that there was a connection among the code of *Shy People* and the *Participation* category. Indeed, our hypothesis was supported by the data. For a graphical representation of the codes linked with the code of Shy People see next in Figure 5.5.



*Figure 5.5- Participation- Shy People*

Data depicted evidence that group members who consider themselves as “shy”, “quiet” or “introvert” feel confident enough to maintain an even contribution in the on-line group. It seems that in a way the on-line environment helped to assure all the group member’s contributions. Interviewees reported feeling more comfortable taking part in the on-line group because the element of fear and discomfort they felt during their face-to-face group meetings had been eliminated. The main reason for such an attitude was reported as the *lack of visual contact*.

“I think that everybody is a lot more inclined to make a contribution when they want to, that it will be the element of people being frightened to speak up and there is a better chance to look up and understand what everybody else is doing rather just being told by them, you can go through their work electronically, there is a record of what is being going on, that you are keeping through your e-mails or in a newsgroup”. (Interview 16, 119:123)

*“Do you think that shy people would participate more in an on-line environment?”*

Yes, Because if they are afraid to speak out face to face then all they've got to do is type and people won't know who's said it.

*Would shy people do the same thing in the face-to-face interaction?*

No". (Interview 34, 188:195))

On the other hand, face-to-face interaction only allowed one person to talk at a time. However, that is not the case for the on-line situation. With the use of modern conferencing systems, more than one person has the chance to participate without needing to wait for turn-taking. Therefore, even shy people, afraid to speak during face-to-face situation, are now able to participate or even "interrupt" their peer students, as interaction, in other words "typing", can happen simultaneously.

*"Do you think that shy people would participate more in the on-line situation?*

Probably, yes.

*Do you consider yourself as a shy person?*

Yes I am, but I think I would participate more on a computer discussion or something like that than if it was face-to-face.

In face to face only one person can be talking at the same time, but with a computer you type in what you want whilst someone else is as well". (Interview 37, 105:113)

The reason why shy people find the courage to phrase their opinion and therefore participate more has already been presented in the *Express* chapter. Shy people no longer have to "physically " participate in the conversation going on. All they need to do to express their opinion is type their input. They do not have to see other people's faces nor do they have to show their face in the group or speak in the presence of their peers. They have to type rather than speak.

"Shy people are more likely to participate on-line because when you are on-line the only thing you have to do is type, you do not care to whom you are speaking, you just type and then you press enter so you do not feel that you are interacting with somebody, and you feel to intervene in someone conversation, you do not see people's faces so you are not feeling very shy". (Interview 40, 204:208)

Therefore, group members who identified themselves as shy, felt more comfortable participating in the on-line group. Being comfortable helped them build their *confidence* and participate more equally.

"It brings out a person you thought you didn't have and it helps a lot with yourself building your confidence, because you could be shy but once you start interacting in a smooth manner, not really in a very strong manner, in a soft manner you built your confidence and once you built your confidence on the actual person really comes on than wouldn't happen if you had to interact face-to-face". (Interview 03, 161:166)

"Well, I do I tend to be more outgoing on-line than I do

when I am face-to-face mainly I think because they cannot see me because I think that the luck of it is that you read what the people look like and what they are doing so I tend to be more shy face-to-face, but I was more confident on-line and more chatty but it sort of ended up the same because I just generally a very chatty person and when I get to know somebody face-to-face I am very chatty and when I know somebody through e-mail or something I am very chatty then so I would reckon that it is a quicker process on the Internet but it ends up about the same".

(Interview 17, 147:154)

As a result based, on all of the above, interviewees reported that the on-line environment helped them to secure an *even contribution*.

"It think it goes back to sort of you are getting on your own, with not having the teacher to tell you what to do all the time. People they don't really know who you are when you are communicating, this works positively for the shy people, they have more of an input.

(Interview 15, 271:274)

"I think that everybody is a lot more inclined to make a contribution when they want to, that it will be the element of people being frightened to speak up and there is a better chance to look up and understand what everybody else is doing rather just being told by them, you can go through their work electronically, there is a record of what is being going on, that you are keeping through your e-mails or in a newsgroup".

(Interview 16, 119:123)

Interviewees also noticed that during the on-line interaction it was not always the loudest person who would monopolise participation.

"That's certainly an advantage, I'd argue that, another advantage I hadn't thought of before is if we're all around this table at a group meeting there's a chance that out of say 12 people, maybe 4 or 5 of them would be very active participants and the others might shy away. That's quite common. Whereas on the Web Board, provided everyone knows how to use it, you can get your voice across, it's not the loudest person who wins. If I type a message on and I'm the quietest person, then the message is there. There's just as much chance that somebody's going to read that".

(Interview 25, 386:392)

Therefore, if all group members' contribution and participation can be secured, eventually the outcome of the group work will be of *better quality*.

"I think there are some advantages because every person can have an input, every person is an input. If someone has got an idea then it is more likely to say it, whereas if you are face-to-face then this person who is shy or whatever will not assist. I think you give everyone an equal say, it is much more democratic, everyone can get their point of view. I think when you have a group of five people and you have five people giving their input then you are going to get a better outcome rather just a group of five people with only

two people assuming to take control and they only put their input and the other three people do what they were told to do. Then you lose that power, their input".

(Interview 10, 298:306)

Based on the above, not only the group's outcome will be better, but even contribution will result in more *equal participation*.

"Yes, I guess so, I guess I use more, I have my chance to make an even contribution because I think you never have this chance in a face-to-face situation because some people they are going to dominate and some others will remain quite, some people they going to get all of things done and some other they won't. I think it is great, it enhances the democracy within the electronic group because in there you can have the same share as everybody else so you can have equal contribution on-line". (Interview 16, 110:115)

"Yes I am, but I think I would participate more on a computer discussion or something like that than if it was face to face. In face to face only one person can be talking at the same time, but with a computer you type in what you want whilst someone else is as well". (Interview 37, 111:113)

## DOMINANT PEOPLE

As has already been mentioned the on-line environment offered more opportunities for all group members to achieve equal participation, despite the presence of dominant group members.

"I found that a couple of people dominated the conversation the more confident ones but everybody had an equal share, I think at first when the conversation starts it is dominated and then eventually you get to a stage where everybody has something to say". (Interview 17, 174:177)

"On-line everyone's equal aren't they. From what I've used everyone contributes the same on-line, but it's face to face where more dominating people put their views across more". (Interview 34, 183:186)

However, it was interesting to try to look for evidence on how "dominant" or "extrovert" group members participated in the on-line situation. It seems that the interviewees supposed that "dominant" people would try to ensure their dominance even on-line.

"A dominant person will participate the same it doesn't really matter if it is on-line or face-to-face, these people they tend to control everything, so it doesn't really matter if they are on-line or face-to-face". (Interview 20, 145:156)

Nevertheless, it is quite difficult to judge dominance in the on-line environment.

"I think it's quite hard to judge dominance really in an on-line environment". (Interview 48, 195:197)

Even so, it seems that assuring dominance on-line, is quite a different task in comparison to face-to-face. Interviewees admitted that it is harder to dominate in the on-line group.

"Yeah we're all participating, because we're mainly doing on-line work we're all participating. As I say if it was actually all just face-to-face work, I think it may be a bit of a different kettle of fish and we've got the person that dominates in our group so he may dominate in an on-line environment that narrows it down a bit. In an on-line environment it's harder for someone to actually dominate. And he's not dominating our on-line groups, this shy person is. And whereas if we were doing face-to-face it would be the other way round. So there's your prime example". (Interview 36, 261:267)

Dominance on-line was mainly expressed and maintained through the use of a number of intervening conditions (See also Intervening Conditions of *Participation* category). However, it seems that *Fast Typing Skills* was the most important means used by group participants in establishing dominance.

"The person that could type well probably will be the dominant one, because some people finding it hard to type, you know they are not used to a keyboard or they are scared of the packages and you get some nervous people thinking if I do this I will crash this and they are not very computer literate, whereas the ones who are computer literate they are the ones who seem to be able to manage the group. The ones who have used the computers for several years are the ones who are more confident".

(Interview 03, 225:231)

On the other hand, expertise in *writing skills* can be one of the factors affecting dominance. If a group member is able to express himself/herself effectively in a written form then he/she will probably dominate on-line more easily.

"If someone couldn't express themselves talking then they're going to be far better off on-line. If they were good at expressing themselves this is how they become dominant on-line".

(Interview 41, 563:565)

Mainly group members managed to express dominance through the quantity of their inputs. But as has already been explained quantity does not always assure the quality of contribution.

*"Dominant people in a face-to-face situation can be dominant on-line as well?"*

Yeah they can be but you can ignore them, which is an interesting thing, like there's a guy called, I don't know if you've interviewed this guy, this guy called Rick, Richard Garland. And in real life he's a big guy and he's really happy, really loud and just a big happy man and when he's in class you know, everybody else will maybe fire a couple of questions at the lecturer you know if they really want to but every five minutes he'll be like "yah, yah, yah", really going for it and ...er ... he won't mind me saying this because he's ... he's a good friend of mine actually.



So it's all right but when we were doing things on that electronic message board for example and he used to find that you had the total number of messages there, you could see how many messages each person had put. And there was, you know, I personally, Simon, Tim and few others you know, reasonably high numbers. But there was one guy who had more numbers than anybody else and that was Rick. And when you read our messages as well they tended to be like conversations you know, so Simon would say something, I'd respond to it then Tim would respond to it and some of them would just be quite fun, they used to be quite short messages like this. And every one of Rick's messages were just huge but the thing was when you read the entire message, it didn't mean anything, it was just a load of rubbish". (Interview 47, 246:262)

*"So, how can we define dominance on-line then?*

I guess, people who hadn't really posted any messages up until that point probably felt quite intimidated by like the two or three who were right at the top, who seemed to have like a huge number of messages, but not everybody read all those messages so they don't know if they're good messages or if they're just a load of rubbish, so it is a form of dominance. If you keep seeing this man's name there as well, you know, he was becoming recognised, you can recognise he was always up there sort of thing so certainly was dominant yeah". (Interview 47, 272:279)

## 5.4 PARTICIPATION: RESULTS

Different levels of participation were reported as results of the on-line interaction. Results of the *Participation* category are reported in the following section, in a very abstract mode as, most of them have already been presented during the previous sections. It seems that all the results are linked to a number of conditions and caused a number of action/interaction strategies among the group participants. In general terms, interviewees reported enjoying *equal amounts of participation* in the on-line group.

"I think it is equally, it was all the members of the group that carried way typing". (Interview 03, 192:192)

"I think that all of us kept on contributing the same, like giving an average participation, there was no such person who would do more or less than the others".  
(Interview 22, 158:159)

Even if some group participants were absent for some time, away from the group activities, they would try to compensate for their absence. In the end all of them contributed equal amounts of work.

"In our group yeah there were and we had I think we had equal participation. So I mean some of them were maybe absent for one of our group sessions because they were too busy doing something else but they'd always make up for it

in the other one and we all did equal amounts of sort of written work for the group project as well as putting it all together, we all contributed to that as well". (Interview 44, 223:227)

Even in the cases when some group participants did not turn up for an on-line session, the rest of the group members were confident that they would be able to find the missing person just by sending an e-mail.

"I usually hear from everyone every week and there's no one that seems to have cut to one side and keeping very quiet even if one of the group members does not turn up at the practical sessions and you know that is going to be easy to catch them just by sending an e-mail, they're a pretty good group". (Interview 35, 150:153)

Additionally, as has already been presented in the action/interaction section, it seems that the so-called *shy people* had more chance of *equal participation* in the on-line group. It appeared that the on-line environment managed to eliminate the control of dominant people, and give better opportunities of participation to all group members.

"Another advantage I hadn't thought of before is if we're all around this table at a group meeting there's a chance that out of say 12 people, maybe 4 or 5 of them would be very active participants and the others might shy away. That's quite common. Whereas on the Web Board, provided everyone knows how to use it, you can get your voice across, it's not the loudest person who wins. If I type a message on and I'm the quietest person, then the message is there. There's just as much chance that somebody's going to read that". (Interview 25, 386:392)

Finally, as has already been shown, gender participation was reported to be insignificant, leading to more equal participation opportunities.

A number of codes were found to be related to the *Enhanced Participation* code. It seems that the acquisition and use of most of the codes appearing under the Intervening Conditions (such as *Familiarity with Computers*, *Familiarity with Software*, *Familiarity with the Subject*, *Level of Interest*, *Group Attendance*) led to enhanced participation in the on-line group. However, the strongest connection among the Intervening Condition codes and the Results was found among the codes of *Familiarity with the Subject* and the *Typing skills*. On the other hand, the lack of acquisition and use of the above intervening conditions led to *Unequal Participation* in the group. However, the codes found mostly connected to the *Unequal Participation* code were the *Face-to-face Participation* in the group, *Familiarity with Computer*, in this case the lack of familiarity with computers, the *Typing Skills* (more specifically the *Slow Typist* code) and the *Technical Problems* during the on-line interaction. Finally, the codes that were mostly found to connect to the *Non Participation* code were the *Technical Problems* and the *Level of Interest* (See section on Intervening Conditions).

As a result a special code was connected to the *More Participation* code. The leader of the group was, and was expected to be the one the most participation in the group. This is

actually one of the reasons that led to the Emergence of the Leader code (See also Leadership group of codes).

"I mean none of these was said, but I felt that three of us were participating more, I actually interacted with one person the most, I felt that he was contributing the most I think and he was probably the leader as well. But sometimes me and the other two we were like also interacting a lot just between us, I think it is quite balanced, there isn't too much like I am the leader so this is my opinion, it is more of so what do you think and we just give our opinion ourselves, so it is quite balanced". (Interview 11, 244:250)

"No, not everyone was participating the same, the British people would participate more. We had face-to-face interactions as well and with British people the conversation was more prolonged and really going. We had some people from Portugal for example who they would never respond. The only responded when we had the deadline they would say sorry but we had already finished our part. However, again even people who would be on-line all the time with the group they wouldn't participate equally, as I said the leader was the one who knows more and I think the he was then one participated the most. What we used to do was, then we would always come to the on-line meeting and we would just learn from him". (Interview 26, 118:126)

## 5.5 PARTICIPATION: CONTRADICTIONS

A connection identified from the data between the codes of face-to-face interaction and *Dominant People*. Interviewees reported that dominant group participants had more chance to participate during the face-to-face situation, or at least they found more ways to exercise their dominant character or become leaders. In general terms, interviewees remarked that dominant personalities would not allow anybody else to participate, they dominated the group.

"The dominant members are participating more in the face-to-face interaction". (Interview 03, 242:243)

"In the group, yes, then the group dynamics of different individuals and their personalities, you get all sorts of people, you get some domineering people and then they don't sort of allow anybody else to participate, I am glad in my group everyone seemed very co-operative, and they were working quite a lot". (Interview 11, 208:211)

On the other hand, shy group participants did not seem to have the chance for equal participation in the group.

"I think you never have the chance to make an even contribution in a face-to-face situation because some people they are going to dominate and some others will remain quiet, some people they are going to get all of things done, and some

other they won't". (Interview 16, 110:113)

"I think they were more likely to participate face-to-face. Because on-line you could not see them, and they could ignore you if you told them to participate or respond, they could just ignore it. But if it is face-to-face they feel more pressured to take part.

*What about shy people do you think that these people would participate in the face-to-face interaction as well?*

Yes, because in our group a lot of us knew everybody else so that probably made people feel more comfortable. But if a shy person was in a group like that and they didn't know the other persons in the group, then probably they wouldn't participate as much".

(Interview 20, 201:212)

As a result certain group members would manage to dominate in the face-to-face group situation creating unequal amounts of participation.

"In terms of communication in the actual group in the meetings there wasn't an equal participation but they tend to be a few dominant members who would say the most but in terms of work we all get the same amount, so it does matter what we said during the meetings". (Interview 07, 188:191)

"They tend to be shy ones, people who are quite shy and the other ones who would participate face-to-face very much, then normally tends to be one or two dominant leaders. Then it sort of gets better but you turn to find that certain people will e-mail certain people, because Jo and I we were the only girls Jo would e-mail me and I would e-mail her and the boys would e-mail each other and then we get together the last minute and it was done like that, it was almost like we had split in two different groups rather than doing it the other way".

(Interview 17, 206:212)

## 5.6 NON-PARTICIPATION

In this code we have included the pieces of data referring to the reasons why group members did not participate in the on-line group. A number of intervening conditions were also identified. One of the main conditions interviewees identified as reasons for not participating in the group relates to their computer fear (techno-phobia). There are some people who simply do not like computers. Computers upset them or simply make them feel uncomfortable.

"I think the fear of the technology, the techophobia as they call it, they just wouldn't want and use the computer actually, they computers upset them".

(Interview 24, 130:132)

Inevitably, group members who are afraid of computers will feel neglected in the group.

"I think that one thing about the on-line facility that we use, this sort of conference system that we worked that there were a couple of people in the group that when we were using during the course they sort of had a laugh about it, I mean when the lines were coming up on the screen they used to have a laugh and other people they were trying to have a serious conversation on that, it does get mad and it does get mixed. There were also a couple of people who did feel a bit sort of left out in using the facilities because they weren't forward enough about the use of these environments, they had fears of using it".  
(Interview 09, 176:183)

However, there were some interviewees who reported that it did not take a long time even for the group members who were afraid of technology, to get used to using it and to build up their confidence.

"Yes, I think it had to do something with that, I think they didn't think they were good enough to communicate, they thought they didn't have the sort of skills they needed and they thought we better not write anything down, I might be doing wrong, I might come out wrong. For my personal experience I did have a bit of that at the time, I was scared to use it because I didn't know what I was going to do, it was going to happen, but the more I used it, the more I played around it, I did learn more just messing around with it, and the more I did that the more I felt that I know I can do that, I know that is fine if I do that, I know that I can type that and press enter. You know you learn things as you go along and the more you learn the more confident you become in using the Internet".  
(Interview 09, 202:210)

The most common action strategies used by the group participants in order to "solve" the problem of non-participation are as follows.

As a first strategy the group members would *discuss* the problem and they would try to solve it.

"No, it wasn't too bad, I know a lot of other groups had problems but it was pretty smooth. Not really, it's like lack of participation from certain groups, but generally when things came through they were pretty much solved by discussion. It wasn't the case where somebody imposed their view - no one said let's do this, full stop. It was more, I think we should do this, can you tell me what you think, whether this is right or wrong".  
(Interview 25, 290:294)

Discussion would involve *asking for explanations*. The group members who did not participate, would have to provide the rest of their peers with explanations.

"Before we see the co-ordinator we must make sure that the person is not participating, we must speak to each other and ask from the person to explain why he/she is not participating. So, they are not giving a satisfying reason then we must see the co-ordinator. The only reason why we

do not need a leader is because virtually the course co-ordinator is the leader in a way. But not in the real world, in the real world you cannot in any case see the boss and start complaining about the group. Of course if you are working in a professional organisation you have some role because you are actually getting paid to do something, so you need to do something". (Interview 22, 204:211)

In cases where some of the group members would not participate, one of the action strategies included the *leader's intervention*.

"I suppose choosing a leader would have been helpful just to give up tasks to the members also help warning people that they didn't contribute the amount of work they needed to contribute, just make people more equal and useful". (Interview 07, 224:226)

It is of interest to note in the following quotation that the realisation of the need for participation in the group also became evident as a part of the collaborative learning process.

"There was one lad who didn't do any work for the first two weeks. There used to be only three people of the group each time, the other two would apologise saying we are sorry or whatever. After that I sent an e-mail saying look this is our group we mean to work together can we please do so from now on? And it seems that all responded after that a bit more. So, I think the fact that everyone was put behind the same thing, and I said put yourselves together that sort of thing seemed to work OK. And all felt OK we have to do some work for the benefit of everyone else I think they felt guilty the fact that they were letting down other people so let's do some work". (Interview 10, 202:210)

Additionally, apart from the leader's intervention, group members also resorted to the course *co-ordinator to intervene* and assure people's participation.

"I find that the teacher doesn't have as much control over the group technically the students could be anywhere and they can still be on-line and the teacher cannot see them. The student could be doing also some other things but as long as they are there and the group members they can reach that person the work can still be done. But I don't feel it as a need at the university and such, unless there problems like the student isn't doing any work, isn't participating. But the university is basically down to the individuals to do his or her own work so in that sense the teachers they are not having to be in control anyway. If you want to learn they will help you develop but they are not there to make sure that you do your work, that is up to you". (Interview 11, 398:406)

As is revealed in the next quotation, the teacher's role in the on-line interaction was limited to the provision of guidance, and intervention when group members failed to participate in the group.

"I guess the teacher will provide the actual guidance you

need, the guide line and maybe suggest the structure to everything because I guess there is a large, very large potential for things to go wrong if there are not directed the right way, if people don't contribute. But after that stage, I think there is a less and less role to play, they actually get there if the students need anything they put suggestions". (Interview 16, 272:276)

As in the previous quotations the teacher's intervention seemed to be the last step when the group members tried to find solutions for someone's non-participation. The first action was the actual discussion among the group members concerning the problem of non-participation and the identification of the reasons why someone was not participating in the group. Then the leader would intervene. Eventually, if no satisfactory solution had been provided, or if the problem remained, then the group members were left with no alternative but to ask for the tutor's intervention.

Finally, group members, if none of the previous actions succeeded, felt that they had to have a *face-to-face meeting* to solve the problem of non-participation.

*"What if you have some people in the group who wouldn't participate at all and they would create problems, what would you do then?"*

I am not the leader type of person, if we had any people who wouldn't participate then I would send an e-mail and probably we would have to meet up". (Interview 40, 235:239)

*"What if you have some people in the group who wouldn't participate at all and they would create problems, what would you do then?"*

Probably have to have a face to face meeting or something like that, to find out why he wasn't participating". (Interview 37, 233:237)

Interviewees seemed to notice that it might be much easier to understand the reasons why a group member did not participate in a face-to-face meeting.

"There's always a chance that someone might not bother to participate and there's nothing really you can do about it during that meeting. But if it's face to face you might ask them what they thought, if they disagree, you can't really do that with the computer if they're not paying attention or they've not logged on or something. You do need to know a bit about the software as well, so basically if you didn't know much about how to use it then it might end up that someone didn't really take part as much".

(Interview 37, 424:431)

The results of non-participation in the group are as follows:

It seems that interviewees said that non participation had not really caused any disagreements rather. There was rather a "black hole", a *missing contribution* in the group. This missing contribution, instead of creating flaming conflicts probably created a negative feeling or disappointment towards the person who would not contribute in the group.

*"Do you think that no participation causes any disagreements*

or conflicts?

It did not cause conflicts the fact that somebody would not contribute to the group, but it did definitely cause bad feelings, which is not the same thing as conflict, conflict means fighting or something. It did not caused problems to the point that we would flame anybody, we just tried to deal with the situation to just to get on with our work, so basically it a missing contribution, it was just a blank spot there". (Interview 28, 200:210)

"We did have conflicts of one member who decided not really to get involved with communicating on-line, so we did not really rely on him to do too much of a course work". (Interview 07, 176:177)

After a while the rest of the group felt that there was nothing that it could do to replace the missing contribution other than expect the *rest of the group members* do the extra work.

"Actually no, not something that I recall. Really, the biggest difficulty as a said was the fact that one group didn't really collaborate that much, they didn't really contribute that much in the group work. Although, I received e-mails from other members of the group talking about conferences on our topic, or to the web sites that we could visit and they would just pass us that. I e-mailed this person once or twice and I obviously received no response, and in fact I don't even remember any contribution at all of that person. So, we basically had to stick to the other members of the group". (Interview 28, 192:198)

"Did no participation cause any problems, disagreements? Not really, if you had anyone missing a session now and then it is normal, you can't expect 100 per cent attendance all the time. I didn't cause a problem really - the other three people in the group would do the work". (Interview 37, 332:336)

Additionally, interviewees reported *delays* in the group interaction and communication due to the missing contribution by certain group members.

"I prefer to do everything on my own, working in group is not very efficient some times you have to come across different problems like participation for instance, if not everybody is turning up and work is always delayed because people are not being punctual. If I do something on my own I can stay up all night and do it, but if I have to do it with other people in a group it might take me two or three days, I prefer I guess to do things individually. I do realise though that getting people in the group with different opinions about things that gives a great diversity in the group, I like to hear people's opinions especially when I do not have very strong opinions about something or I do not know a subject very well, then yes I like learning from other people. But I do prefer to work on my own, I do have very strong opinions about I what want and about how I want to work, I guess I am a very opinionated person". (Interview 40, 53:66)



## 5.7 PARTICIPATION: DISCUSSION

### 5.7.1 CONTEXT

During the data analysis a theme arose concerning the assessment of group members' participation in the group. Assessing and judging someone's participation in a face-to-face situation is a relatively easy task for the group members; as people are used to assessing participation in this mode. When group members act in a face-to-face mode it is relatively easy to work out who the group members are that participate the most, and who are the ones that do not participate. However, during the interviews patterns emerged in connection with the assessment of group members' participation in the on-line group. How do group members judge peer participation on-line? What are the parameters and the criteria used to "measure" participation of the other group members?

The issues of quality and quantity of participation appear quite often in the literature, as authors have tried to determine quantity (Henri, 1992) or quality of participation in computer conferencing (Harasim, 1993a; Mason, 1989). Interviewees noticed the difficulty of assessing someone's participation in the group and also commented on the need for the establishment of criteria on participation assessment. During the Open Coding procedures in analysis the code *Participation Assessment* emerged and placed with the contextual conditions in the *Participation* category. The *Participation Assessment* code had mainly two subcategories named *Quality* and *Quantity* of participation. The two codes adopted here resemble the term "overall" and "active" participation used by Henri (1992). Henri's overall participation deals with the number of messages and quantitative data supplied by the server, whereas active participation refers mainly to exchanges related to the learning process. *Quantity* of participation was based on a number of codes such as the number of log ons into the system, the number of inputs, the number of words of each input, the number of links and information provided, and finally the frequency of inputs. It seemed that the frequency of inputs is the most important criterion for judging group members' participation among the quantitative ones.

However, it was noted several times by the interviewees that the quantitative criteria are not enough on their own to define, establish and determine participation in the on-line group. A number of quotations referred to the question of quality and quantity of the group members' input. Interviewees seemed to agree that the qualitative criteria were the more important ones in defining participation. Therefore, in the majority of the cases participation assessment by group members was based on the content, or, in other words, the quality of inputs. *Quality* was determined and based on the following criteria: quality (content) of information, volume of information, provision of feedback, relevance to the topic. The quality of information

refers to the actual content of the inputs, as it seems that the number of inputs is not a satisfactory criterion if not related to relevant content. The volume of information refers to the degree of information provided, if the group members offered enough information. Another way of determining quality of participation was also the provision of feedback. However, among all the different categories of quality participation assessment mentioned by the interviewees, the most important and frequent one was the relevance of the information provided to the topic under investigation. A group member might contribute to the group with lots of messages but there is a chance that the messages were not relevant to the topic. Therefore, the group members have to measure the quality based on the relevance of the inputs to the topic under discussion. If a group member makes lots of comments but does not actually contribute to the topic of interest then the comments are invaluable. Interviewees reported their preference for small but well-developed comments in comparison to massive quantities of text that in the end did not make sense. They showed a preference for "right" rather than "lots" of messages. However, it seemed that the on-line communication helped the group members to value their peers' inputs.

It is important to note that the code *quality participation assessment* connects to the code of *visualisation* (see also *Expression* category). The fact that all group participants' contributions were shown on the computer screen seems to have helped group members to value the quality of their peer participation. Finally, in some quotations a connection between frequency of contribution and the emergence of dominance in on-line environments was identified. Some interviewees supported the idea that people who tend to dominate the group are the ones with the most input and contribution to the group. However, it was again mentioned that the frequency of contribution does not necessarily imply their quality.

### **5.7.2 INTERVENING CONDITIONS**

A number of intervening factors were found to either facilitate or constrain the on-line group participation processes. One of the most important conditions, *Familiarity with the computer* (a code with a great number of quotations attached to it) was found to make a considerable difference to group members' participation. A group member holding a fair level of familiarity with computers seemed to feel more comfortable during the on-line group interaction. Therefore, by feeling more comfortable this specific person increased his or her confidence. As a result participation in the group appeared to be enhanced. Interviewees also provided information on what happened in the cases where group members did not enjoy great familiarity with computers. As a consequence group members felt left out or even reluctant to participate in the group. The importance of handling basic computer skills as a

condition of successful participation in CMC based courses was often stressed in the literature (Foell, 1989; Anderson and Lee, 1995; Ross et al., 1995). Waggoner (1992) also includes previous related experience with the technology among the conditions, which required attention to insure full participation. Ross (1996) for his part suggests that students with limited computer skills might also have fewer chances for participation. However, he indicates that computer communication skills had only a modest impact on student participation. Any difficulties encountered were resolved and eventually "students with weak communication skills participated as well as students with stronger skills" (Ross, 1996: 49). Oliver et al. (1998) also suggest that in instances of experienced and novice users of computer and software, the expert is assumed to take control.

Often in their interviews group participants appeared to make a comparison between the codes of *Familiarity with computers* and *Familiarity with the software*. Therefore, attempting to make the comparison among the quotations revealed a new code named *Familiarity with the software*. Comparison between the two codes testified the importance of the first code. In other words, familiarity with the software was found not to be as significant for the participation in the group, as familiarity with computers. Nevertheless, it was still considered to be a factor influencing the participation processes. Additionally, interviewees reported a number of reasons why familiarity with the software is not considered to be very essential. Explanations mainly dealt with the user friendliness of the newly developed software. Familiarity with the software was not considered to be an impediment to the participation in the on-line environment, even for novice users. Consequently, familiarity with the software affected participation in the on-line group but lost its importance due to the user-friendliness of the newly developed software. Additionally, new users do not need to make full use of specific software in order to be able to communicate. The knowledge of some basic functions or commands of the software is adequate to allow group members to communicate. Interviewees also reported facing problems with the new software only the first few times they used it. After a while they were not concerned any more about the lack of full knowledge of the software. Eventually, communication via the software became easier so the group participants no longer thought about it.

Another factor coded among the intervening conditions in the *Participation* category was named *Familiarity with the Subject*. *Familiarity with the Subject* was reported to help group participants as they managed to contribute to the on-line conversation with more ideas. Interviewees reported that prior knowledge of the subject under investigation affected their participation in the group in a positive way. Participants in the cases where there was prior knowledge reported an enhanced participation. It is quite important to note that the codes *Familiarity with the Subject* and *Enhanced Participation* when checked against each other were found to co-exist in every case. Additionally, finer knowledge of the subject enhances

the outcome of the on-line conversation. If group members have familiarity with the topic then it is more likely that they will have a better conversation with their peers. In the literature, "prior knowledge" or "previous related experience" appeared as a factor affecting participation in computer conferencing. Kerr and Hiltz (1982) placed previous related experience among the basic skills for the use of computer conferencing in collaborative learning. McCreary and Van Duren (1987) and Ross (1996) found in their studies that prior experience with the subject had a positive effect on students' participation. In particular, Ross (1996) gives special attention to the existence of prior knowledge as he found that prior knowledge helped students to offer suggestions and guidance and to engage in all forms of argument.

Another important condition found to affect participation during the on-line group interaction was the code named *Typing Skills*. The importance of the specific code was underlined by the great number of quotations linked to it and by the frequency of references in individual interviews.

Paying closer attention to the quotations linked to the typing skills in connection to the *Participation* category, we discovered that the typing skills were mainly connected to the synchronous mode of on-line group communication. The above observation was in a way expected, as it is the synchronous mode of on-line communication that requires almost instant responses by group members. If a group member desires to be able to keep up with the rest of the group then he/she requires the employment of fast typing skills. During the course of analysis of the interview data it became evident that "typing skills" is an extremely important factor intervening in the process and progress of the on-line group interaction. For Collins and Berge (1996) the synchronous mode of communication works in favour of those who can read and absorb information quickly, are able to hold multiple discussion threads in their heads at the same time, and they can type with some accuracy and speed. Data from the interviews depicted two different types of typists: *slow* and *fast* typists. A medium way was also recognised where interviewees referred to group members with the *same level* of typing ability.

It seemed that group members with advanced typing skills had more chance of participation. Additionally, typing skills and computer literacy were found to assist group participants to express dominance in the on-line group. On the other hand, a number of quotations identified where *Typing Skills* did not appear to play a vital role in the participation process. Further analysis of those quotations revealed that in those cases group members reported being at relatively the same level of typing skills. Therefore, it seems that if the group members enjoy the same level of typing skills, either high or low, then the on-line interaction is not affected.

In addition, a number of quotations referred to cases with group participants with *weak typing skills*. Group members with weak typing skills reported facing a number of inconveniences. Firstly, they reported having to work harder in order to be able to keep up with the rest of the group. Secondly, group members with poor typing skills were found to feel uncomfortable with the on-line situation and therefore became frustrated. Thirdly, lack of typing skills led to time loss. Additionally, poor typing skills forced group members to become unable to follow the on-line discussion leading eventually into discontinuity. Finally, poor typing skills result in unequal participation among the group members. Group members unable to type equal amounts of contributions end up not having an equivalent share of participation. As a consequence, slow typists, unable to absorb and handle the on-line information, expressed a preference to for face-to-face communication. However, it will have to be noted at this point that some of the interviewees agreed that if the condition of the fast typing skills could to be met, then they would probably consider viewing face-to-face and on-line communication on the same basis. After all, typing skills are a condition that can be improved by practising. Group members can improve their typing skills and therefore eliminate this factor found to affect on-line group communication to such a degree.

Interviewees talked about both synchronous and asynchronous modes of communication in the group. However, data revealed that typing skills were not found to be an important parameter during asynchronous communication. Group participants with weak typing skills suggested that they could use the extra time allowance provided by the asynchronous communication in order to compose their contribution at their own pace. They seemed to suggest that contributions could be typed in advance, saved and then used in the group. In this way, the choice of the type of on-line communication (synchronous or asynchronous) might be only a matter of personal preference and might be used accordingly to accommodate the group's needs.

Murphy et al. (1998) considered typing skills to be one of the dramatic barriers to computer conferencing as students have to learn to communicate with short messages and pause for feedback. They also reported that rapid typists in their study found real-time chats more convenient for brainstorming, eliciting immediate feedback, and spontaneity.

Another code named *Group Size* referring to the number of group members was also tested against the participation category. The group size was placed among the intervening conditions affecting participation. It seems that a large on-line group would be difficult to handle, therefore it would affect participation. Group member participation was reported to be more equal in small groups. There were not many quotations available to support a strong link between the two codes. However, this is definitely an area that needs further investigation in future research.

Some quotations also showed a possible connection between the codes of participation and the *level of interest* group participants were showing for the handling of the topic under investigation. There were also some quotations which presented a weak connection among participation and the level of interest of part-time students. The level of interest of part-time students was reported as relatively low in comparison to full-time students. However, this is again an area that seeks additional investigation in the future.

Participation also seemed to be affected by the code named *group attendance*. Some of the group members managed to escape attendance and therefore missed participation for a few weeks. Escaping attendance in the group appeared to have been assisted by the on-line environment.

Another big set of codes found to affect on-line group participation comes under the name *Technical Problems*. Technical problems were found to constrain participation in the group and were mainly referred to as "hardware" or "software" problems. The hardware problems referred to the system's stability and reliability whereas, the software problems referred to the reliability of the specific software used each time.

A large number of students complained about the hardware and software stability. The experience of technical problems and more specifically of system crashes also appears quite often in the literature (Graham & Scarborough, 1999; Harasim, 1993a; Berge, 1997; Cifuentes et al., 1997). Interviewees initially reported feeling uncomfortable with the situation, then being annoyed, but as the situation deteriorated they became disappointed, confused, frustrated, and even threatened. Therefore, interviewees admitted losing control over the online group situation, and felt the immediate need to use software and hardware that is stable, and suitable to the group needs. In addition, due to technical problems group participants lost lots of valuable time in the group. Rimmershaw (1999) also reports the technical problems as being off-putting and time-consuming. Technical problems eventually affected participation in the group. Group members were either unable to participate in the group, or would share unequal amounts of participation in comparison to other groups that did not have to face problems of a technical nature.

### **5.7.3 ACTION/INTERACTION STRATEGIES**

Themes emerging during the interview analysis linked with the action/interaction strategies in the *Participation* category were mainly coded into two groups. The first one deals with gender issues and the second is concerned with personality issues.

Initially, one of the questions asked during the interviews dealt with gender participation. Interviewees were asked if the gender of the group participants affected participation in any possible way. By asking such a question the underlying intention was to check interviewees' insights into participation by the opposite sex.

However, in the majority of cases, interviewees reported gender as being an insignificant factor in on-line group participation. This result seems to agree with Ory et al. (1997) who also found no significant gender differences as males and females were found to have similar attitudes about their computer experiences. This result supports McConnell's (1997) finding that the medium of computer conferencing offers new opportunities for female members to participate more equally. However, this result seems to disagree with Herring (1993) who reported gender differences, male domination and continuation of the pre-existing patterns of hierarchy. In this study, the most vital explanations given by the interviewees on such attitudes dealt mainly with the lack of communication cues due to the text-based on-line environment. Group members' identity is not easily recognisable on-line due to the use of intentional or even unintentional "nicknames". Therefore, as the group members' gender is not identifiable it cannot play a role, let alone an important role in the on-line group member participation, with the result of equal participation in the group.

Although gender is not identifiable due to the lack of visual contact among the group members, interviewees seemed to be able to recognise the sender's age. The identification of the sender's age was mainly based on the use of language. Different age groups seem to use language in different ways. As online communication is based on the exchange of text, group members were more able to recognise the sender's age than their gender.

Interviewees also supplied personalised viewpoints about participation. There was a case where a female interviewee reported forming a second group within the existing on-line group, explaining her attitude on the basis that females tend to form social groups. As a result females might have a more intense need to meet face-to-face and establish relationships in the group in comparison to their male peers. However, if we see gender participation in the on-line group from a male's point of view, data support slightly changes. Male interviewees reported females hesitating to participate as much in face-to-face group situations. Due to embarrassment and fear of being exposed in front of the rest of the group. Additionally, it should be noted that interviewees reported signs of male domination, in connection with a face-to-face group situation, resulting in unequal participation in the group. It is necessary to add at this point that there was not enough evidence and data to strongly support the above arguments. However, we conceived them as relatively important ones that would need further exploration in future research.

However, as one of the interviewees noticed, gender issues in both on-line and face-to-face communication have probably been misunderstood. As already mentioned the most important factor in both modes of communication is the communication ability. Thus, ability in communicating is not a gender but a personality characteristic.

Therefore, the *personality* code including two different types of group members' attitudes such as dominant and shy was tested against the participation category in an attempt to establish some of the factors effecting both personality and participation in the on-line group. A number of quotations were found to prove and define the connection between the two family codes. However, although personality seemed to influence the way group members participated in the group, it was obvious by the data that the personality code was mostly linked with face-to-face participation. Interviewees noticed that in the on-line interaction it is not always the loudest person who monopolises participation. The role of psychological variables such as personality has been recognised by the literature (Kerr & Hiltz, 1982; Conlon, 1997; Karayan and Crowe, 1997). Colon (1997) comments that personality, which played an important role in face-to-face situations, was diminished on-line as students were found to be more actively involved in the on-line discussions.

Initially, data showed evidence that group members who considered themselves as "shy", "quiet" or "introvert" felt confident enough to contribute in the on-line group and therefore assured an equal participation. The reasons why shy group members enjoyed more chances of participation are linked directly to the lack of communication cues. The lack of direct and visual contact seemed to help less dominant group participants to overcome the fear and discomfort felt during the face-to-face communication. Indeed, shy group participants commented about being actually afraid to speak and participate in the face-to-face group situations. However, shy people do not have to "physically" participate in the conversation going on any more. Bullen (1997) in his research also found that shy or introverted students who had "difficulty participating in campus-based classes, found the online environment liberating because it allowed them time to contribute, free from the competition of more verbally adept students" (p.176). Harasim (1993a) in particular connects active participation of shy people in computer conferencing with its asynchronous mode.

Additionally, another characteristic of the face-to-face group interaction is that the interruptions made by dominant participants seemed to have been eliminated in the on-line interaction. Shy group members do not run the risk of getting interrupted by the other dominant group members, they do not have to wait for their turn to participate. Their participation (typing) can happen simultaneously with the other group participants even the dominant ones. All they need to do to express their opinion is typing their input. The elimination of the need for turn taking in computer conferencing has also been discussed in



the literature (Mason & Kaye, 1990). Shy students can participate in computer conferencing and get actively involved in on-line discussions without running the risk of being interrupted by more dominant participants (Eastmond, 1994; Conlon, 1997).

Based on all of the above, group members who identified themselves as shy managed to built up becoming initially more comfortable and then eventually more confident. Therefore, they managed to secure an even contribution in the group that resulted to equal shares of participation. Moreover, the quality of the group's outcome was affected and was reported to be of better quality. If all group members have a chance to participate equally in the group, then the final group outcome will be better.

Having found data on how shy group members participated in the group a picture on how "dominant" or "extrovert" group members might participate in the on-line situation was drawn. It seemed that the so-called "dominant" people would make an attempt to ensure their dominance on-line. However, lots of questions arose from such a statement. How do group members become dominate on-line? Do the same factors affect dominance on-line as in the face-to-face situation? The answers to these questions suggest that it is quite difficult to judge dominance in the on-line environment. But not only that, it seems that establishing and assuring dominance on-line is a hard task to do.

Dominance on-line was mainly expressed and maintained through the use of a number of intervening conditions (See also Intervening Conditions of Participation category). Firstly, fast Typing Skills seemed to have helped group members to establish dominance. Additionally, writing skills expertise can also be used by the group members in order to express dominance. However, group members mainly managed to express dominance through quantity of inputs. Some group members used to dominating the face-to-face group interaction seemed that they would have to the same position in the on-line group. Therefore, they tried to force their dominance through the number of inputs sent to the rest of the group members. But as it has been explained before in the participation assessment section, quantity does not always assure quality of contribution, and lots of group members seemed to be aware of this.

In connection with the *Participation* category another code named *Non Participation* was found. The code was also found to be one of the main reasons causing problems, conflicts and disagreements in the on-line group. However, the code of *Non Participation* was connected to a large number of quotations. A number of causes, conditions and results were identified. Paying closer attention to the quotations linked to it, the main reason why the group members failed to participate in the group was identified. The computer fear (technophobia) of certain group members was found to be the prime reason behind non-

participation. Group members lacking familiarity with computers failed to participate in the group and therefore they felt neglected.

However, group members having to face the problem of non-participation reacted in a number of ways. Initially, they chose to discuss the problem with the member who did not participate, trying to identify the reasons why something like that had happened. Possibly, the leader would get involved by trying to provide the group with some solution to the problem. If the leader was not able to solve the problem then the group members had to ask for the teacher's intervention. It has to be noted that this was one of the rare occasions in the group's interaction where the course co-ordinator was asked to play a vital role intervening with the group process. Finally, if none of the above have worked then the group members felt that they had to have a face-to-face meeting to solve the problem of non-participation. The face-to-face direct interaction could help them to identify the causes why and, possibly, solve the problem of non-participation.

As results of the non-participation in the on-line group, interviewees identified the creation of a negative feeling or disappointment towards the person who would not contribute to the group. The missing contribution also caused delays in the group interaction. Therefore, the rest of the group felt that there was nothing to be done to replace the missing contribution apart from giving extra work to the other group members, who tried to compensate for the missing contribution. Finally, non-participation probably led to conflicts and disagreements among the group participants.

Different degrees of participation by group members resulted from the group interaction. Initially, it seems that in general terms, the vast majority of the interviewees reported enjoying *equal* amounts of *participation* in the on-line group. The most interesting results presented shy people as having more chance of equal participation in the on-line group. It appears that the on-line environment managed to eliminate the control of dominant people, and give better opportunities of participation to all group members. The issue of equal participation has often been mentioned in the literature in a number of studies supporting the argument that CMC environments can provide a forum offering more chance of equal participation to all of the participants (Siegel et al., 1986; Hiltz et al., 1986; Easton et al., 1990; Kiesler et al, 1984) soothing hierarchical structures (Kiesler & Sproul, 1987). Gender participation reported to be insignificant, leading to more equal participation opportunities for both males and females.

Additionally, the code of *Enhanced Participation* appeared to be related to a number of intervening conditions such as *Familiarity with Computers*, *Familiarity with Software*, *Familiarity with the Subject*, *Level of Interest*, *Group Attendance*. On the other hand, the lack of acquisition and use of the above intervening conditions could lead to *Unequal*

*Participation* in the group. Codes connected to the *Unequal Participation* code were *Face-to-face Participation* in the group and the lack of familiarity with computers, the *Slow Typist* code and the *Technical Problems* during the on-line interaction. Finally, the codes that mostly found to connect to the *Non Participation* code were *Technical Problems* and *Level of Interest*.

# **CHAPTER 6:**

## **RESULTS**

### **DECISION MAKING**

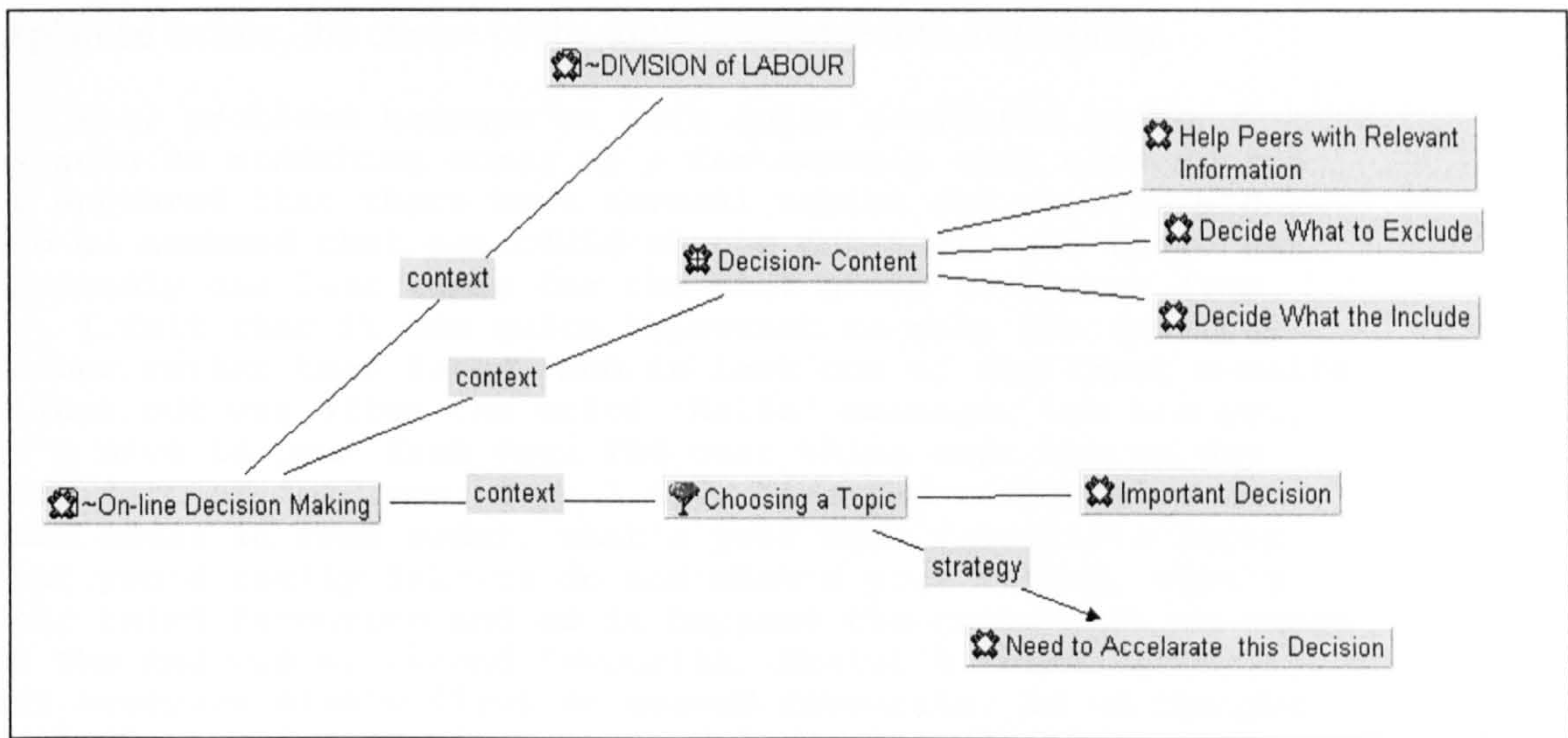
### **IN COMPUTER**

### **CONFERENCING**

# 6. DECISION-MAKING IN GROUP COMPUTER CONFERENCING

## 6.1 DECISION MAKING: CONTEXT

The interviews revealed that there were mainly three different kinds of decisions which had to be made during the on-line interaction, namely the *choice of the topic*, the *content* of the final report, and the *division of labour* among the group members as seen in the following Figure 6.1.



*Figure 6.1- Contextual Conditions of On-line Decision-Making*

The way interviewees worked in the on-line group involved the investigation of a topic and the production of a report on the topic chosen by the end of the semester. Therefore, one of the decisions the group members had initially to make dealt with the *choice of the topic*, peers had to undertake and investigate. Data revealed that the choice of the topic was quite an essential decision. The next interviewee stresses the importance of such a decision.

"The most important decision we had to make as a group was the choice of the actual topic we were going to work on. We kind of selected one and asked people to give their opinions, if they were willing to do this, so that was really the most important decision, and after that really in terms of actually collecting stuff towards the end, it was a bit disorganised, it wasn't really decided by the whole group, it was a kind of go ahead, although for instance for collecting documents together, people were told what to do, and people said yes fine, no problem".  
(Interview 28, 300:306)

On the other hand, the choice of the topic apart from being an important decision had also to be as immediate as possible. Since there was only a specific number of topics available, the group members had to accelerate this decision in order to make sure that they would choose a topic suitable to all group participants before other groups did.

"Except this guy the rest of us we kept on doing things, like we discussed the topics at first using chat, and after that we decided which topics we would like to do. Unfortunately, the first topic that we had chosen, it was chosen by another group as well, so we had to choose another one". (Interview 22, 142:145)

The selection of the topic among the group members was mainly performed by *discussion*. Interviewees reported discussing their preferences in a democratic mode. Finally, they decided which one was the most appropriate, meeting everyone's preferences. However, as explained before, the choice of the topic was subject to availability.

"No real problems because we were quite motivated persons, as soon as something comes up - for example this came up and it appeared that there were several topics and several groups and we assumed that one could choose one topic and there was obviously one less topic for the next group to choose from. So, I felt that it was quite important to make the decision sooner rather than later, and in fact one of the first e-mails I sent out was after the brief 'Hello' message, how are you, it's nice to hear from you. The next thing was, can we set some sort of deadline, 2 or 3 days time and really give me some ideas in rank order, what's your most favourable topic that you'd really like to do and what's your second, what's your third favourite and as it happens the topic that we chose in the end was my second favourite, Gratsi's third favourite, but everyone else's first or second favourite. So we thought, well OK, the democratic vote said let's do that particular one and as soon as we'd counted up the votes if you like, we sent the message that we want this one. I think we were one of the first groups to actually choose it so - by doing that we had full choice of all the topics, it also laid a sort of precedent for the future, sort of we're not going to waste time, we're just going to do it". (Interview 25, 272:286)

However, the choice of the topic lead sometimes led to arguments and *disagreements* among the group members.

"Initially, we had some sort of disagreement when we were trying to choose which topic we were going to do. For example, one of the topics was about the role of the nations under the Internet arrival my approach would be to define the role of the nations and then a brief history about the Internet and then how the Internet would effect the role of the nations. However, one member of the group had a different approach, very detailed one, not general, but I thought for one thousand words you cannot actually explore something very deeply. So, what I did was, I've put the article (what I wrote) on-line and I said look this is my opinion, if you have any objections or arguments on

that, just tell me. He did was, he wrote an html format file and said this is my opinion, and this is the first draft of it. If you have any problems, just say something. Finally, what we did was, we used this format, the framework but we changed the content of the file, and we did not make it very specific to a particular country but we kept it rather general. So finally, we used my idea and his framework, we put all that together and we produced the final product". (Interview 22, 216:229)

"Actually when we were choosing the topic we had some sort of disagreement from people wanting to choose another topic, and they would say this better or this is better. But we did come to one decision and then it changed to something else but I cannot remember why, but that was the only thing that was the major problem, the only disagreement". (Interview 23, 210:214)

Another important decision which had to be made by the group participants involved the *content* of the final product. When group members constructed their contribution to the group's work then a decision had to be made on what to include or exclude in the final report.

"We always used to get together as a group and we would discuss what we were thinking, how we should continue with the work, what we should include or exclude from the information we had". (Interview 24, 175:177)

"I think basically the main decisions that had to be made were really content, what to include and what to exclude, we had a lot of material. If people had gone to some hard work, you don't want to say to someone, we don't want any of your work. I think we did that through discussion, and that's where the Web Board was quite good, actually, because we could post our own comments in and we said well when we break up the title of the question it looks like we need to re-focus on this, this and this".  
(Interview 25, 258:263)

It is interesting to note the fact that the decision on what to include or exclude from the final product was group orientated. Interviewees also reported that being aware of their peers' tasks helped them by providing them with extra material when they came across any relevant information.

"We decided all together what needed to be done from all the members of the group, we decided on the main structure of the projects, which each part should include. At the beginning everyone is looking for information for every part of the project, but we do not give anything in text format we only provide the other members of the group with links we find during our searches, and ask people to go and have a look. Then everyone says what part of the project prefers to work on and then we split the links and everyone is working on their bit. At the same time if any member of the group comes across something that doesn't belong to their part but belongs to the project their would provide with the link the members who is doing this part.

So, you put everything together and you sent the thing in a text format". (Interview 29, 228:237)

### 6.1.1 DIVISION OF LABOUR

The *Division of Labour* code was initially coded as a separate category. However, as the analysis progressed, it became clear that interviewees themselves were confusing division of labour or tasks with the decision-making procedures. Therefore, Division of Labour was placed among the *Decision-making* category codes. After all, the division of tasks among the group members is one of most important decisions group participants have to make. A graphical representation of the codes related to the *Division of Labour* is seen next in Figure 6.2.

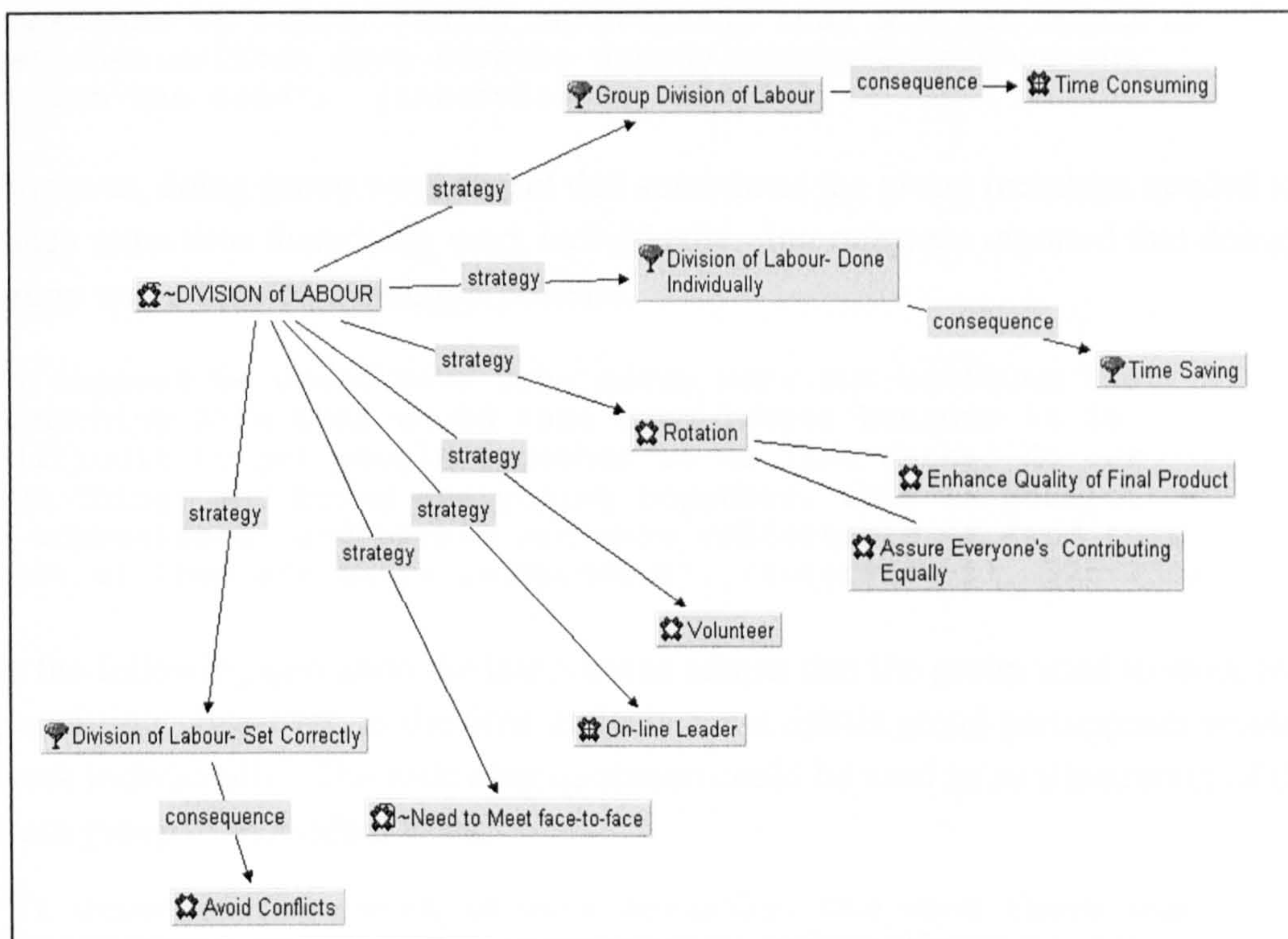


Figure 6.2- *Division of Labour*

It seems that the group members mainly followed three patterns during the division of labour. They would either divide the task, working together as a group, or they would work individually or they would use a kind of rotation system.

There were some cases where interviewees admitted to working collaboratively as a group on each aspect of the group project. However, it needs to be noted that these cases were not so many.

"We'd look at all the questions briefly and then put on what we thought about each one quickly, and then if there's enough in that we'd just leave that one, and once we've done this one we'd concentrate on the next one a bit more to try and get that



done. We didn't really designate the tasks particularly".  
(Interview 37, 387:392)

On the other hand, there were a few cases where interviewees seemed to be very aware and sensitive of the fact that they had to produce group work. Therefore, they would do everything as a group.

"We work collaboratively on its question all together, because we know that each one of us is going to have different ideas, because we all put our ideas into it, so we are all like working there sitting there, and we are all putting in our ideas into it. When you say your ideas everybody listens to you and then you need to work out what you are going to say at the end of it, and you just have to have each one of us agreed with it. Sometimes you see some people may not understand you and then they think of them and sometimes they just can't understand what you saying. Or sometimes if nobody really understands they are not going to get them written down because nobody understands what one person has said". (Interview 38, 352:363)

However, doing group work meant that sometimes the group members needed to allocate much more time than doing work individually. Interviewees reported that doing a task as a group was a time consuming procedure.

"I suppose we could have done group work but we found that something like that would take even longer because it is difficult to get people together so we just rather do our own things and bring everything together, this is more of a convenience, and people are more comfortable. I find that most of them are quite independent". (Interview 11, 326:330)

In the following quotation the interviewee admits that the group used to work together, time permitting. However, as the time limits became tighter group participants would chose to work individually. The following quotation could be used as an illustration of the transition from group to individual work.

"It depended from week to week actually. One week there was like a server went down or something. Before that we were having problems getting on-line, we'd wasted about 45 minutes to an hour trying to get everyone on-line at the same time, so that week we said we'd just divide those four questions up, and we just divided each question up to one person, got them to do their own work on that answer and then put all the answers together at the end. But this week, we all got on pretty earlyish so we just went through each question discussing it one after another, all in a group rather than doing it individually [as a group]. Yes we all came on-line and discussed one question and then we moved onto the next question and we all discussed that, but when we were short of time we just divided the tasks up individually - one person went to do one question and one another.

*Is it a matter of time then?*

It was that week, yes, because we were running out of time we wouldn't have had time to all discuss each question as

a group going through it one by one so to save time, one person did one question, one person did another question because that would have been quicker than discussing each question as a whole group one by one, because it obviously takes longer that way.

*Which way do you think that is better?*

It's better as a group discussing it - we would have preferred to do it that way but we wouldn't have actually got the task done if we'd done it that way".

(Interview 30, 226:251)

On the other hand, dividing the tasks and doing things individually was reported being a time saving procedure.

"So, it does sort of draw things out of it, it does a sort of increase but then when you are doing stuff because you get on individually with it you can perhaps work a lot better than sit around the whole group on-line and say we should do this and that, bla, bla, bla. If everyone has a task to do it is much quicker, everyone can get on with their thing and they come back". (Interview 10, 497:501)

Group members seemed to work in the following pattern. They would discuss and figure out what the topic needed, make the headlines and the structure, and split the topic into individual parts. Then, they would go away to deal with their topic individually. In the meantime, they would exchange ideas and information on each other's tasks and finally they would meet to put everything together and write the conclusions.

"I think we started by splitting the activities and then we carried on with what we had to do. If we had to answer a set of questions we sort of said if we take one question each, research it and send it off by the day it will have to be there (by the deadline)". (Interview 15, 173:177)

"We all had our own ideas, then we all did the questions individually, then what we did was we put our ideas together over e-mail, one of us would put the ideas together and sent it out to everybody else and they did their corrections according to what they thought and then we would produce the final draft between us but normally was sent to one person to put together everybody's ideas, they would send to one person and then he/she would put it together". (Interview 17, 191:196)

"We didn't really, we all did all of it and then brought our ideas together. We all read the whole thing, we all wrote down our ideas and then we all came with our ideas and then came with the conclusions.

*Didn't that take longer then?*

It probably did, but then if there were four questions, and we said you do question 1, you do question 2, you do 3, then there's no point doing group work because it's still one person answering each question. If all four of you have a go at it takes longer but you get better answers".

(Interview 31, 235:243)

Additionally, it seems that some of the group members worked in an overlapping sense. They did not work exclusively either as a group or as an individual. It seems that they tried to use a "rotation" system. The group members would split the topics among them but they would take more questions than they were supposed to. In this way they ended up with some questions that overlapped. Therefore, they were able to discuss the points in common with their peers and then decide what to include (the best quality information) in the final draft of the group work.

"It was normally sort of a case of about three or four questions that we had to answer and send off, so we'd just say "right, question one. Who's got ideas on question one?" and whoever would write their ideas up and then they'd comment on them and people would add stuff and then when we'd exhausted question one someone's say "oh right, let's move on to question two, I think we've done enough of that". Although having said that we haven't done that for the group project. For the group project we've taken individual questions and there is seven questions and there's five members in our group. So each person's taken two questions and they overlap with someone else's, so then they're going to pool their answer. We're going to do the questions individually and then e-mail, the two people who've done the same question they're going to e-mail together and print off one thing and then bring that to a face-to-face meeting".  
(Interview 41, 391:403)

Interviewees admitted working in this fashion with the intention of assuring that all group members would be handling equal tasks in the group and of enhancing the quality of their final work. Working in this mode, group members could compare their findings (contributions) and then choose the best ones.

"I think there was about eight different issues in the group course-work and we felt we all should do an equal number each. So we all chose a few. I think it worked out two each but we decided to choose three each. So that some of the people's research would overlap so there'd be different angles on the same thing and then when we'd all found out what each other's research decided which ones were the most important bits to put in. However, we didn't all do the exact same work, like I said we all went away and did our own research and then Among ourselves we all saw what each other's work was and how We tackled it and we agreed which were the best parts. But I didn't put all the final bit together, we all agreed on what was to be done about it, and one of the other lads did it. So all they did was just fit it together. You know the different issues sort of in order but we all sort of agreed to an introduction and a conclusion. However, when we had to produce the mini projects every week we usually all seemed to have the same number of questions in our group so we'd all just go away and do one part each. We were all on the chat rooms and we was all sort of contributing that but for the other ones, well we didn't know about the Yahoo chat room, and we had an even longer time lag so we just used e-mail". (Interview 44, 367:383)

Additionally, the group members admitted leaving the division of labour to only one group participant. It is not very clear from the data if this person was the so-called leader, or the editor or just one of the group members who had been chosen randomly. It seems that the group members not really have a formal process of identifying such a person. This person could be a volunteer.

"This person is volunteered, that is bad because though it hasn't happened yet - it's possible one week one will volunteer and it may just keep on that one person's doing it, but the group seems pretty motivated, and it seemed to have worked like that. This person it hasn't been the same every time". (Interview 35, 255:258)

Or the leader.

"It depended sometimes I suggested that we should split things up in a certain way and another times somebody else would suggest how we should work.

*So, was the one who would make the suggestions, the one who would take the leadership?*

Yes, it was like that". (Interview 15, 151:157)

Finally, interviewees reported their need to set a face-to-face meeting in order to be able to divide their tasks and to be assured that everyone had a task. They reported feeling insecure about deciding such an important task on-line.

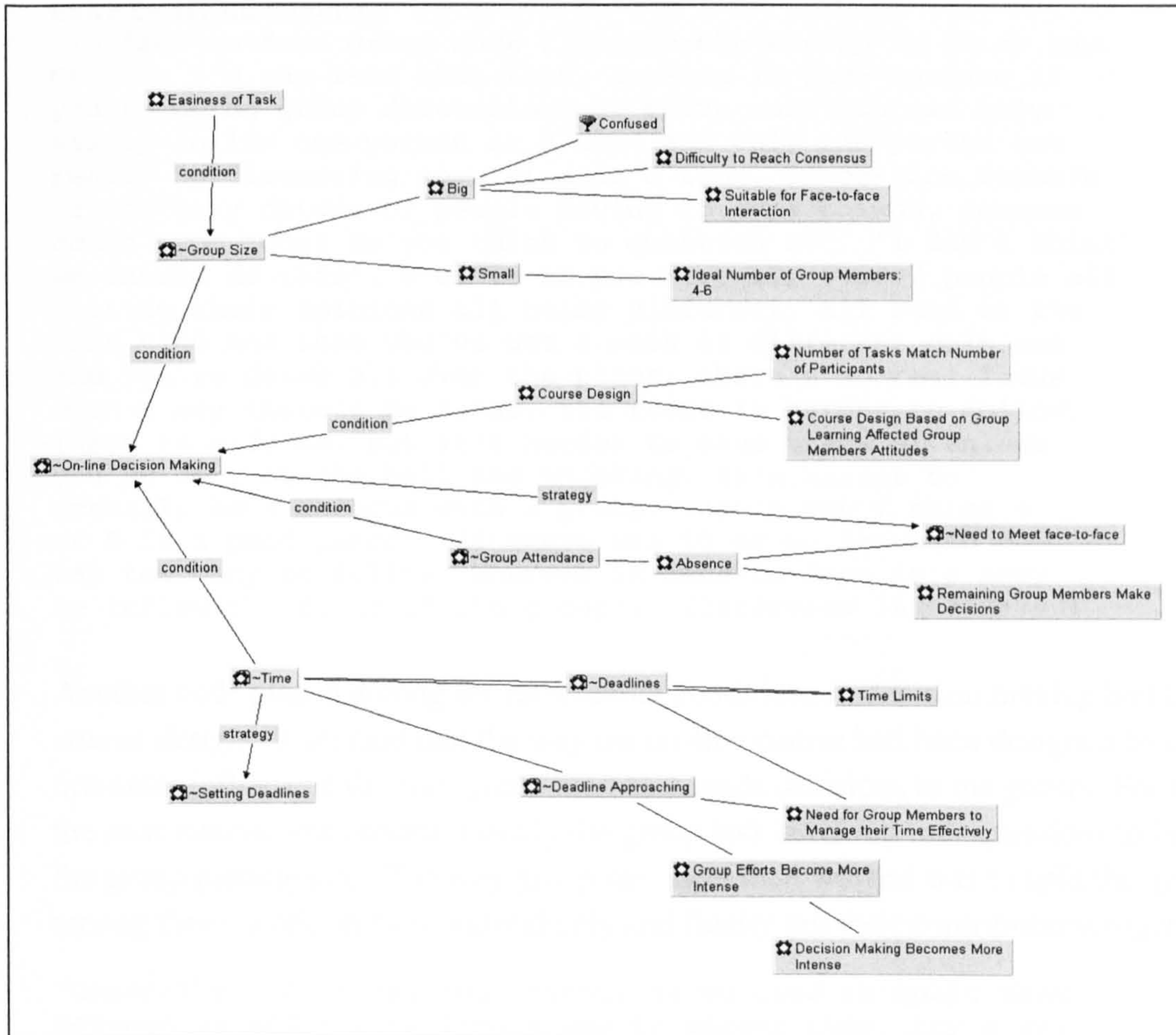
"On-line everybody tends to have more of say, the group turns to be less split, you wouldn't have a split group. However, you cannot get the work done you need the face-to-face communication in order split who is going to do what because you can guarantee that every time somebody wouldn't pick up their e-mail and they wouldn't know what they are doing, then you don't end up running back and trying to do it yourself". (Interview 17, 231:235)

"We had a few face-to-face meetings, we had one face-to-face meeting at first to decide who was doing which section and when we would next meet. And if we had any problems in between we would get to each other through e-mail". (Interview 21, 303:306)

A connection between the avoidance of conflict and the proper division of labour was also found. It seems that interviewees commented that if the division of tasks has been set correctly, and everyone in the group had agreed with it, then this was a way of avoiding conflict in the on-line group.

## 6.2 DECISION MAKING: INTERVENING CONDITIONS

A number of intervening conditions are linked to the category of decision-making. Codes such as *group size*, *course design*, *group attendance*, and *time* seemed to affect the on-line decision-making procedure. Intervening conditions are presenting as follows in Figure 6.3.



*Figure 6.3- Intervening Conditions in On-line Decision-Making*

As the interviewees reported one of the intervening conditions which influenced the procedure of decision making was the *group size*, in other words the number of people in the group. It seems that the majority of the interviewees agreed that the ideal number of members in the on-line group is 4 or 5 people. Interviewees also noted that if a group got bigger then it was really difficult for the group members to reach consensus.

"I think, the ideal number would be 3-4 people not more than 4, because 2 is too small you know you only get 2 people and also you are more chatty with 2 people I think, much more chatty with 2 people with them. 4 people you have more to

concentrate, maybe 4 or 5 people more people, it's very difficult to come a consensus". (Interview 38, 246:251)

The next interviewee explains why it is difficult for the group to reach a consensus and make sense of the on-line interaction. If there are 10 or even 6 or 7 group members then the synchronous interaction gets confusing. Thus it becomes increasingly difficult for the group to remain focused. Attention should be paid to the comparison made by the next interviewee between the on-line and face-to-face group situation. It seems that a group size of 10 people is not much of a problem in a face-to-face interaction the focus of the face-to-face group is more easily maintained.

"In face-to-face group work I'd probably say up to 10 or say. On-line I'd say less than that. Because in face-to-face if you're doing group discussions or group work you can only easily follow one person at a time and only one person can really be discussing something at a time. In on-line because of the very nature of people having to type things, someone could type "what do you think to question 1?", "I don't think we should do this". 6 or 7, if you were 10, 6 or 7 people all writing their opinions all being different, all send at the same time and then you've got a mass of different opinions and you're going all over the place, there's no real focus when I say there's no focus, the focus is harder to follow. There is a focus. But it's harder to keep track of unless you're very on the ball and thinking. It's harder to actually have a focus with a group. That's why I think 4 or 5 is a good number. If there was 10 or so it would be way too many to follow. Whereas in face-to-face it's easy to follow the focus of the group". (Interview 36, 769:780)

Another code placed among the intervening conditions in decision making had to do with the *course design*. It seemed that the way the on-line course had been designed by the course coordinator influenced the way group members made decisions in the group. For instance, as the next interviewee reports, usually the group task involved four questions to be handled by the group participants. The way group members then worked was to split the questions among them, work on them individually and finally put their contributions together.

"Generally, if it was four questions we used to split them between us and try to find a way to answer them, try a way around that. I don't think we really had any disagreements, it was really straight forward. Yes, it was like 4 people 4 questions, take one each and then one guided it, everybody would do what they had to do, and then take everyone's contributions and put them all together". (Interview 16, 172:176)

Additionally, the following example shows how course design influenced decision-making in the group. In the following quotation the interviewee noticed that decision-making was very much group orientated. The explanation given is directly connected to the course design. The interviewee admits that group members, aware of the fact that the course was designed on the basis of on-line group learning, did their best to familiarise themselves with the group learning procedures, and therefore made decisions together.

"The decision making it was very much group orientated, there wasn't a decision or anything that it would pass without everyone having something to say. We made the decisions as a group because the course was a lot to do with working as a group in an on-line situation, we were more aware of having to work as a group in the on-line situation, we were trying our best to do it, the best we possibly could because we knew that having to do that would involve getting everyone to put their own point of view about what we were going to do. So, people were assigned on the things they had to do and problems were solved in a group situation. In the on-line situation only happened during the lesson you can guarantee that everyone will be there, apart from that it was done face-to-face in the meeting when we had everybody. I think definitely in an on-line situation everyone can put their point of view".  
(Interview 9, 230:240)

Another condition influencing decision-making was found to be the code-named *Group Attendance*. Some interviewees remarked that when some of their peers were absent for an on-line session, they would be forced to make decisions on their behalf. The next interviewee also notes how difficult it was to bring group participants on-line and persuade them to work.

"We did not have that many, we only had a few deciding quite basic things, and deciding which tasks to do, basically we just picked one, so it is quite straight forward but then the other two guys they had to make one of the decisions for one of them and the other one came in, there is only four areas. I suppose we could have done group work but we found that something like that would take even longer because it is difficult to get people together so we just rather do our own things and bring everything together, this is more of a convenience, and people are more comfortable. I find that most of them are quite independent".  
(Interview 11, 323:330)

Due to the missing attendance, group members chose to meet face-to-face, in an attempt to persuade the rest of their group participants to turn up and therefore participate in the procedure of decision-making.

"After we did this main project we had this slight problem of not knowing who was going to be in at what time, how often people check e-mails, or some of them went on holidays and so on. So, we just said we will meet face-to-face today".  
(Interview 11, 263:266)

One of the most important factors influencing the on-line decision-making procedure is the factor of *Time*. Group members appreciated time issues as one of the main factors intervening with their group interaction. The interviewees recognised the importance and value of the factor of time pressure as group interaction had to take place in predefined time limits. Therefore, group members had to take extra care of the management of their time.

"It is more like we would give our suggestions, or some times me a leader I would suggest something and I would ask for group members' opinions, if you don't receive a

response in a given time then you just go ahead with a decision. We tried to be as democratic as possible but sometimes we just couldn't do it, time is something to valuable". (Interview 24, 217:221)

"Obviously the next thing to do was try to link them up together and think about the overall things that affect open distance learning in each of those countries, the barriers or whatever. That was pretty much done through discussion, mostly we paste the stuff on the Web Board, then I got all the stuff together in one huge document, and said OK this is every idea we've had in the last 2 months, send me your version of this in an e-mail, tell me if there's a bit missing or this needs to be cut out. It bigger, then smaller, then bigger and we end up with a huge document and then I think they were quite happy for us to edit out the stuff we didn't need. So we did that and every time we changed to version we pinned it up on the Web Board again and said OK, can you send us your feedback - we need the feedback by 6 o'clock tomorrow. So we had a lot of deadlines within - we did set ourselves a task and said OK - right we don't want this lingering, we've got other work to do as well, everybody has, let's say we need this in 2 day's time. Everybody knew that time was an issue". (Interview 25, 308:321)

However, why is time considered to be an important factor? The factor of time is defined through the pre-set deadlines by the course organisers. It is the deadlines that set the limits for the group's actions as they have to learn to act within the time limits and manage their time accordingly.

"One particular person would be asked to take up a particular thing. Everybody would send their thing; he or she had to compile it and send it. Compile it, sorted it out, say what he or she thinks and send it. And before sending compile it and send it back to everybody before sending it to the teacher. So, we could say all right this looks quite good we can send it now before the deadline". (Interview 06, 254:259)

"I think we started by splitting the activities and then we carried on with what we had to do. If we had to answer a set of questions we sort of said if we take one question each, research it and send it of by the day it will have to be there (by the deadline)". (Interview 15, 174:177)

It was noticed that the group's efforts became more intense as the deadline approached. It seems that as the time limits were became increasingly tighter, there was a realisation of the necessity for organisation within the group. In the next cases, it is one of the dominant group members who decides to take some action so that the group is able to finish their task in the pre-set time limits.

"We didn't actually have a formal process on how to divide the tasks, we kind of just got on and did it. Initially, it has arisen what sort of topics we would do, and what the



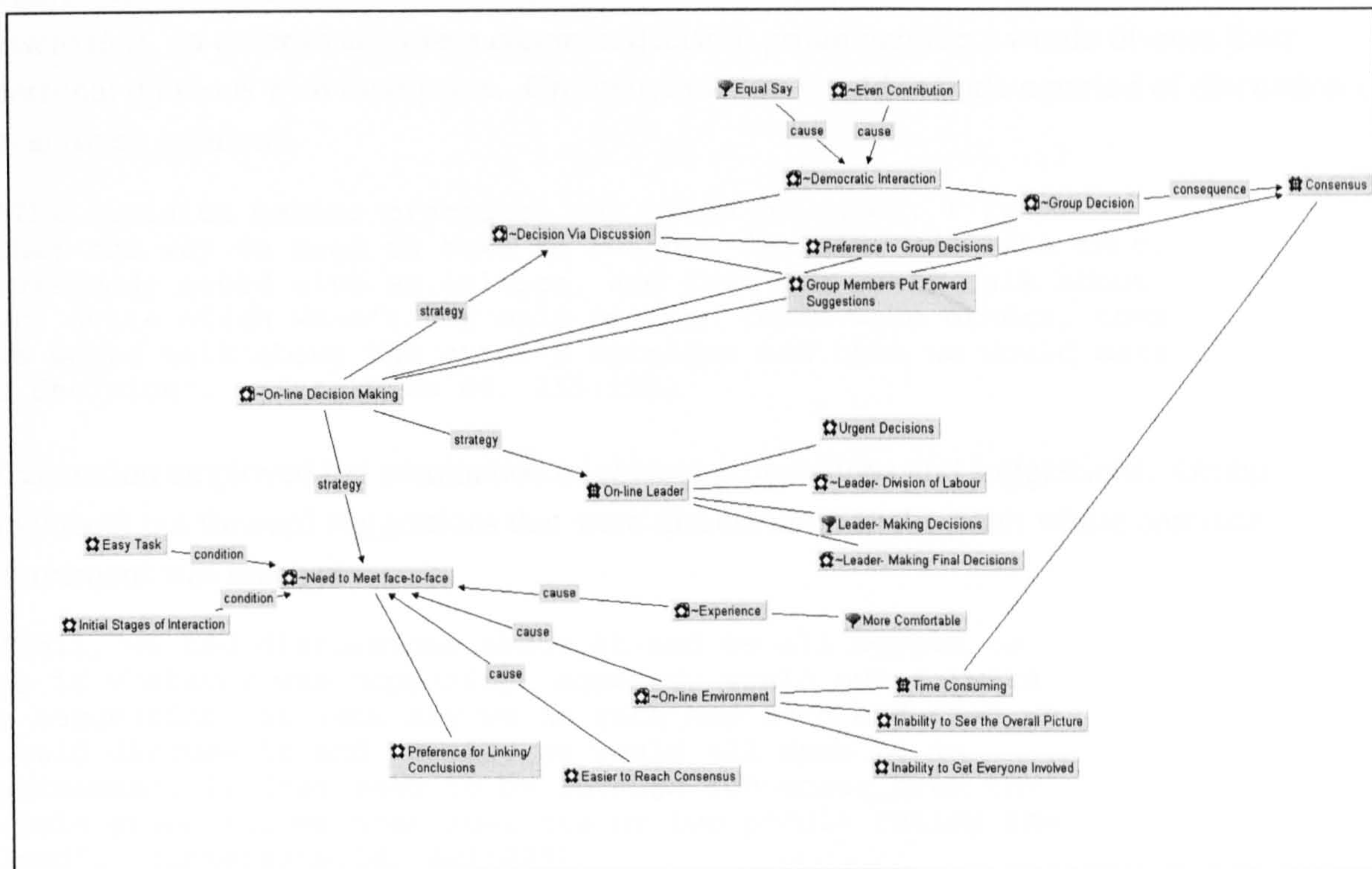
subject heading would be, and the advantages and disadvantages of our topic, and the definition of our topic. Initially, we organised that and we said why don't you do this or that, and somebody would say I will just add a new title or I will add a few new things on the topic, I will create a new thread on the topic. But then, near the end it happened more individually, somebody would be more dominant and somebody would pick up and would carry on. And somebody would put all the comments together, such as cutting and pasting things together. And then we needed more of organisation, and later towards the end of the deadline I decided that if anybody wasn't doing anything about writing a report then I would do it. And actually, finally I managed to get a hold of the people, because it was a dead period over Christmas where no so many people were around, and I just managed to get on with that and just let people know, and I tried to send e-mails to people regarding literature on our topic and references and stuff". (Interview 28, 228:241)

Another action was also employed by some group participants in order to overcome the difficulties of time limits. They tried to set their own deadline in advance. Choosing to set a deadline before the actual course submission deadline, provided group members with the luxury of having a little bit of extra time to make the necessary changes and corrections in the group coursework. By applying such action group members managed to be on time and schedule.

"Yes that's right. No real problems because we were quite motivated persons, as soon as something comes up - for example this came up and it appeared that there were several topics and several groups and we assumed that one could choose one topic and there was obviously one less topic for the next group to choose from. So I felt that it was quite important to make the decision sooner rather than later, and in fact one of the first e-mails I sent out was after the brief 'Hello' message, how are you, it's nice to hear from you. The next thing was, can we set some sort of deadline, 2 or 3 days time and really give me some ideas in rank order, what's your most favourable topic that you'd really like to do and what's your second, what's your third favourite and as it happens the topic that we chose in the end was my second favourite, Gratsi's third favourite, but everyone else's first or second favourite. So we thought, well OK, the democratic vote said let's do that particular one and as soon as we'd counted up the votes if you like, we sent the message that we want this one. I think we were one of the first groups to actually choose it so - by doing that we had full choice of all the topics, it also laid a sort of precedent for the future, sort of we're not going to waste time, we're just going to do it". (Interview 25, 272:286)

## 6.3 DECISION MAKING: ACTION/INTERACTION STRATEGIES

Data revealed a number of strategies employed by the group participants during decision-making as next presented in Figure 6.4.



*Figure 6.4- Action/Interaction Strategies in Decision-Making*

As has already been noticed in other parts of this research, the decision-making procedure was considered to be very much group orientated. Additionally, interviewees reported that they preferred group decisions to individual ones.

"The decision making it was very much group orientated, there wasn't a decision or anything that it would pass without everyone having something to say. We made the decisions as a group because the course was a lot to do with working as a group in an on-line situation, we were more aware of having to work as a group in the on-line situation, we were trying our best to do it, the best we possibly could because we knew that having to do that would involve getting everyone to put their own point of view about what we were going to do. So, people were assigned on the things they had to do and problems were solved in a group situation. In the on-line situation only happened during the lesson you can guarantee that everyone will be there, apart from that it was done face-to-face in the meeting when we had everybody. I think definitely in an

on-line situation everyone can put their point of view".  
(Interview 09, 230:240)

"Well, I think it is much more a group thing as opposed to one person telling other people what to do. Yes, I think it is a group decision on what is going on, we didn't vote or anything but we were fairly easy about it, they would just say OK if that is what we need then we do not mind doing that". (Interview 10,248:252)

Therefore, with the aim of achieving a group decision, interaction was mainly based on *discussion*. In order to achieve a common decision group members would discuss their personal opinions with their peers. Group interaction would include a period of discussion of everyone's opinions.

"The decision making procedure was quite balanced. I think that the way we used to take to reach a decision was like that, everybody would give an opinion, and then you would talk about it, quite often wasn't the only opinion there were others, then we would talk about the other's opinions and then we would make a decision". (Interview 04, 153:156)

Discussion employed the nomination of several propositions and suggestions. Group members put forward suggestions that were discussed up to the point where common agreement was reached.

"Well, we had discussions about it and we all agreed to do it whatever was happening, somebody would put forward a suggestion, or lets say we do such and such and then we would discuss it and usually we would all come to an agreement. It does seem to be through consensus from the whole group rather than just one or two people taking the lead". (Interview 18, 201:205)

"Well, some would come with an idea and then we would discuss it, then we would cover other ideas as well and we would discuss those and then we would make a decision, or we would come to the decision based on the original idea".  
(Interview 23, 193:196)

Based on conditions such as chances to maintain an even contribution in the on-line environment (as it has been presented before in the *Participation* category), group members can participate more actively in the decision-making procedure.

"I guess I use more, I have my chance to make an even contribution because I think you never have this chance in a face-to-face situation because some people they are going to dominate and some others will remain quite, some people they going to get all of things done and some other they won't. I think it is great, it enhances the democracy within the electronic group because in there you can have the same share as everybody else so you can have equal contribution on-line". (Interview 16, 110:115)

Therefore, group participants managed to assure an equal say.

"I think you give everyone an equal say, it is much more democratic, everyone can get their point of view across". (Interview 10, 300:302)

"On on-line everyone's equal aren't they. From what I've used everyone contributes the same on-line, but it's face to face where more dominating people put their views across more". (Interview 34, 184:186)

Moreover, discussion used as the main strategy for the decision-making procedure was considered to have promoted *democratic interaction* in the group.

"I think that in an on-line decision making everybody speaks whereas in face-to-face some people might speak and others might stay quiet. Might be for the obvious reason of being the polite or anything and they say "oh, let it go, it is all right". Whereas in an on-line environment everyone is sending e-mails and have an opinion, somebody is saying do this and that. I think so that on-line everybody speaks more democratic". (Interview 06, 298:302)

It is quite interesting to note in the following quotation how democratic interaction involved voting and counting the votes.

"No real problems because we were quite motivated persons, as soon as something comes up - for example this came up and it appeared that there were several topics and several groups and we assumed that one could choose one topic and there was obviously one less topic for the next group to choose from. So I felt that it was quite important to make the decision sooner rather than later, and in fact one of the first e-mails I sent out was after the brief 'Hello' message, how are you, it's nice to hear from you. The next thing was, can we set some sort of deadline, 2 or 3 days time and really give me some ideas in rank order, what's your most favourable topic that you'd really like to do and what's your second, what's your third favourite and as it happens the topic that we chose in the end was my second favourite, Gratsi's third favourite, but everyone else's first or second favourite. So we thought, well OK, the democratic vote said let's do that particular one and as soon as we'd counted up the votes if you like, we sent the message that we want this one. I think we were one of the first groups to actually choose it so - by doing that we had full choice of all the topics, it also laid a sort of precedent for the future, sort of we're not going to waste time, we're just going to do it". (Interview 25, 271:286)

Apart from on-line discussion the next action group members employed in order to make a decision was a *face-to-face meeting*. The number of quotations linked with this code reveal that the group members would quite often choose to meet face-to-face with their peers in order to be able to make a decision. When an interviewee was asked how the group decided on what to include in the document to be sent to the teachers, he did not hesitate in his answer: "we had to meet face-to-face".

"Then you are going to have to make a decision on what to include in each question, how do you do that?

Then we meet face-t-face and we make this decision".

(Interview 39, 328:331)

Interviewees based their preference on a number of reasons. Firstly, interviewees commented on being familiar with the procedure of decision-making carried out in a face-to-face mode. Therefore, they felt comfortable performing decision-making in a mode every group member had experience of.

"On the other hand, we used to work face-to-face we have experience on how to do that, so it is easier in a way to mix on-line and face-to-face working". (Interview 39, 167:169)

Secondly, the procedure of trying to make a decision on-line and put everyone's contribution together proved to be very time consuming. Group members repeated that they were unable to reach a decision. Therefore, they had to meet face-to-face.

"Yes, I do feel this need because the members of my group you find it very difficult to put everything we wanted together if we do not meet face-to-face. It seems that you repeating the same ideas again and again, and that is very time consuming and you do not make something out of it".

(Interview 39, 164:167)

On the other hand, interviewees reported experiencing problems of being unable to see and appreciate the overall picture of a problem in the on-line environment. As a result the group members could not make a decision unless they met face-to-face and were able to see and estimate the whole picture of a situation, then make a decision accordingly.

"Somebody is typing and we are all checking in things while someone is typing, and different times different people type different things, there isn't a leader. But it doesn't mean that one person who is typing is putting all their effort into it, they are saying what other people think and then confirm with the group, "shall I say this then", "is this right", taking all the ideas and that's why it's easier face to face because at the end of the day you need to come face to face I think to actually come to a decision. Because in on line it's just not easy to see the whole picture". (Interview 38, 337:343)

Finally, interviewees reported as another reason for their preference for face-to-face meetings their inability caused by the on-line environment to get every group member involved in the decision-making procedure.

"On-line you see it's very difficult to get all involved that's why you come face to face so we can all get involved, otherwise if you just having it done on line then one person is just going to say from their point of view because they are the leader or whatever you just say you assign somebody to write everything down and then they are just going to use all the other opinions". (Interview 38, 373:379)

For the reasons explained above group members admitted their preference for meeting face-to-face in order to make a decision. In the end, they found it easier to reach consensus in a face-to-face mode.

"We did meet quite a lot, because we did get some work done on like through e-mail but I think we just needed all to be there together to make sure that we all agreed because when someone says they agree through an e-mail it doesn't necessarily mean that they agree. So we just sort of all met up just to make sure that everyone was sure what we was doing". (Interview 44, 183:186)

It also needs to be pointed out that interviewees reported being more comfortable making a decision in the initial stages. However, as the difficulty of dealing with the topic and its complexity increased, and group members needed to discuss conclusions, link contributions together and get the overall picture of their work, then the need for a face-to-face meeting was identified.

"What has been happening so far is that we have a task, and then somebody will start e-mailing the rest four normally, normally not me actually, I only respond. We also trying to do the task, if it is a matter of finding a web site, then that was quite straight forward, everyone just contributed once and one of us just said shall I send a list then, and everybody would approve and we would get copies. After we did this main project we had this slight problem of not knowing who was going to be in at what time, how often people check e-mails, or some of them went on holidays and so on. So, we just said we will meet face-to-face today. Everybody did their bit first, we did exchange some ideas, especially between me and another girl. I think we are going to get together and discuss the conclusions and the overall, just linking everything together, and that is about it, the piece of work". (Interview 11, 259:268)

Additionally, the *leader* seemed to be involved in cases of the final decision-making.

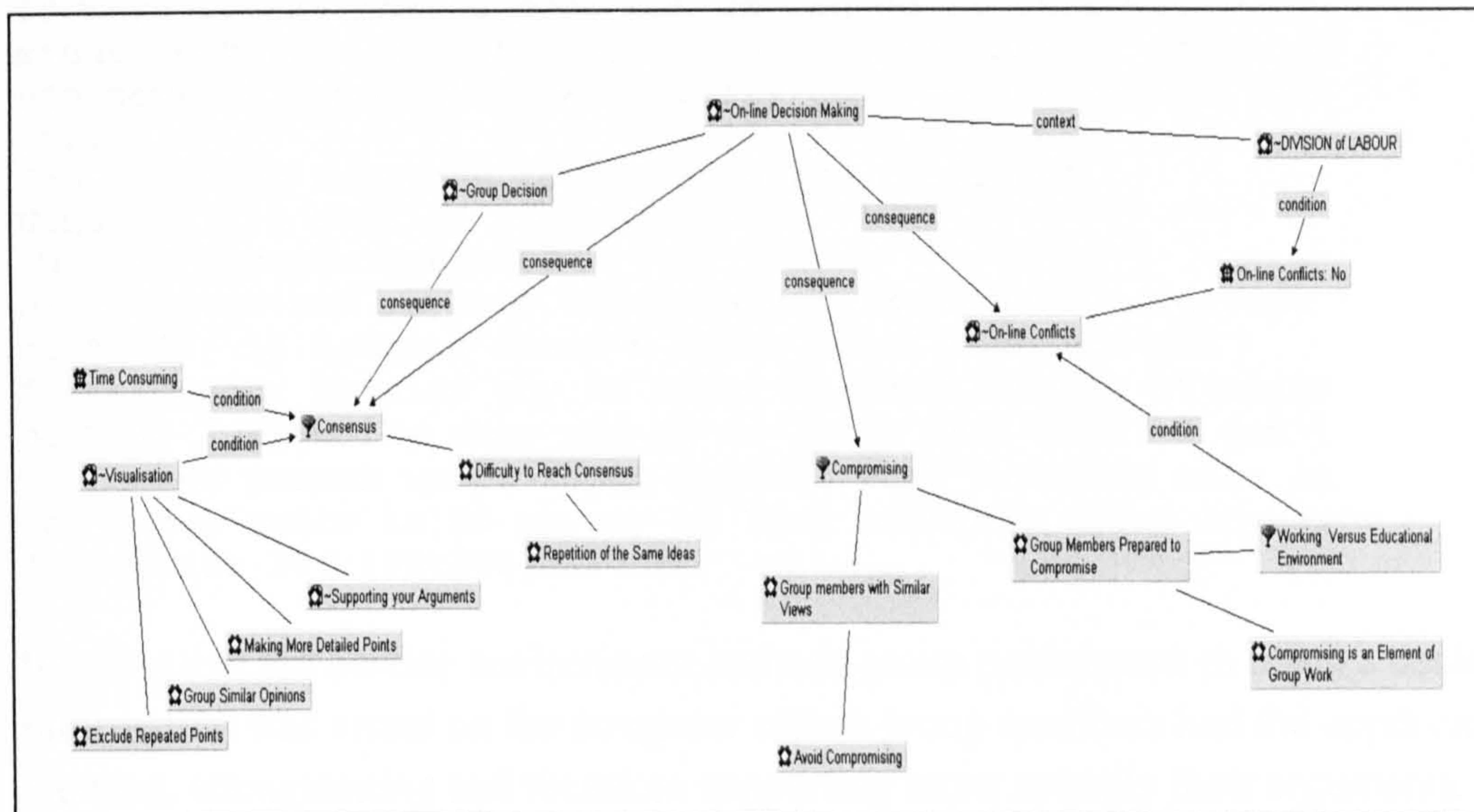
"It is normally one person. Once we all put it together it is up to one person to make the final decision and send it. (Interview 05, 172:174)

In particular, the leader seemed to mostly interfere when an urgent decision needed to be made.

"If you have to make an urgent decision I don't think that it can be a common decision, I doubt it very much, it has to be the leader, definitely it has to be the leader, the co-ordinator because he is the one who gets the ideas, and decides what should be in and what should be out, he is the one who should know what goes wrong, and what goes right. I think that it is expected for him the bear the responsibility". (Interview 24, 236:240)

## 6.4 DECISION MAKING: CONSEQUENCES

The decision-making procedures in the group led to a number of outcomes as presented in the next Figure 6.5.



*Figure 6.5- On-line Decision-Making Consequences*

As it has already been presented in the action/interaction strategies of the *Decision-Making* category, group members tried to reach a common ground and obtain a group decision through discussion.

"Well, we had discussions about it and we all agreed to do it whatever was happening, somebody would put forward a suggestion, or lets say we do such and such and then we would discuss it and usually we would all come to an agreement. It does seem to be through consensus from the whole group rather than just one or two people taking the lead". (Interview 18, 201:205)

It seems that the group members preferred the decision to be a group one, representing the majority of the group member's opinions.

"We all had to agree, I mean looking back it tends to be that someone would say lets do this and the other we would just fall into that and that it would be the leader. But other times would just came to the same decision anyway, because we all agreed.

*Did everyone have to agree then for the decision to be made?*  
We preferred that way, so the most of the times it was like a common decision, the vast majority". (Interview 23, 199:206)

The procedure of decision making started with a person who would put forward a suggestion on how to work on a specific topic. This was followed by discussion and eventually all the group members would have to agree and reach a common decision.

*"What about the procedure of the decisions making, when you had to do a specific task. Did you have a certain way of acting?"*

It just starts with one person putting their suggestion forward and then someone else would either agree with that, or if they don't agree with it they put their own suggestion forward or say that's good but we can do it this way which might be better. Eventually everyone will sort of agree on one sort of suggestion. We usually come to a decision that way.

*Did you want everyone to agree on the decision?*

Usually it's best if everyone does.

*What if someone doesn't?*

We've never had anybody disagree yet. Eventually everyone sort of - if someone doesn't agree first then you put forward your opinion why it might be good and why it might be bad. Eventually they say OK we'll do that then. I don't think one person wants to go against what everyone else in the group wants to do anyway so they probably agree anyway". (Interview 23, 199:206)

It seems that the on-line environment assisted group participants to reach a decision. As all information was visual on the computer screen group members had the opportunity of viewing, strengthening and therefore supporting more strongly their arguments.

*"We work collaboratively on its question all together, because we know that each one of us is going to have different ideas, because we all put our ideas into it, so we are all like working there sitting there, and we are all putting in our ideas into it. When you say your ideas everybody listens to you and then you need to work out what you are going to say at the end of it, and you just have to have each one of us agreed with it". (Interview 38, 354:358)*

Having the information visible on the screen also helped group members to appreciate their peers' points and avoid repetition.

*"What about the procedure of the decisions making, when you had to do a specific task. Did you have a certain way of acting?"*  
When he was asking questions we normally just all read the case material and then all individually put our ideas in on screen and then, if everyone had the same idea we'd leave it, if people had different ideas we'd not argue but point out why we think our idea is right and then eventually we'd all come to the same decision. Then at the end we'd all sit down and write the final conclusion together.

*Would you like it to be like a common decision?*

We didn't say everybody has to say yes, generally the questions were fairly self explanatory, then there wasn't really much problem with people having different ideas - everybody had the same basic ideas anyway, so it wasn't really a problem". (Interview 31, 210:220)

However, the decision-making could be even more time consuming when group participants were not willing to discuss and negotiate their points of views.



"It might take a long time to get to the decision if there's no conformity, if everyone has different ideas and they're stuck with their ideas". (Interview 31, 353:356)

In such cases, group members ran the risk of getting stuck in a perpetual repetition of the same ideas.

"It seems that you repeating the same ideas again and again, and that is very time consuming and you do not make something out of it". (Interview 39, 165:167)

"I think it's always hard to meet everyone's ideas and opinions. I think at some point everyone's going to have give and take a little bit. I think the fact that we actually don't just send off our ideas then let someone else decide on it because otherwise you're going to get just their personal opinion. The fact we re-bounce it back to ourselves and reassess it, we're all assessing everyone else's comments as well. So you are actually kind of all participating a little bit. I mean you could spend a lot of time going backwards and forwards but I think if you only do it once. Because we're only doing studies rather than actually work as it were it's not as important". (Interview 36, 605:615)

On-line decision-making also led to *compromising*. One of the interviewees who talked about "compromising" in the group made a very interesting point. He remarked that he was not annoyed by the fact that he had to compromise. Trying to explain such attitude he commented that if he was in a work environment then he would "battle for his corner". However, since the interaction took place in an academic environment, he did not mind compromising.

"Yeah there's been a couple of times when all of us have had to compromise and as I say give a little bit of give and take. But because of the nature of the stuff we're doing it doesn't really bother me too much. If it was work based environment and I felt it was wrong or something, yes I'd battle for my corner as it were. Because it's studies and stuff like that and when I say it doesn't matter, it does matter, but it doesn't matter if you know what I mean. It's not as important in my eyes. I can't see the point at this stage to get too worried and too heat up over what we're doing. As long as we've done the research and we know how to use the software and we can find the information and then we send off quality information, it doesn't matter if the most important in my eyes, the most important points in my eyes, it doesn't matter if they're there or not as long as some of them are. It doesn't matter if they all are". (Interview 36, 617:628)

In other cases interviewees admitted compromising during the decision-making procedure basing their explanation on the nature of the group work. Group work meant that all the group members had to compromise at some point. Being opinionated can only cause trouble and conflicts in the group. Therefore, there is a point where everyone has to compromise to find a middle way accommodating all group members.

"Yeah, well because I've done a lot of group work in college and I know that if you start being stubborn it just causes conflict and then you're not going to achieve anything. So, you've all got to compromise".

(Interview 44, 400:404)

Interviewees reported having no arguments and conflicts during the decision-making procedure. As presented before the only cases of reported *conflicts* were connected to the choice of the topic.

"In the group work I've done there were all strong minds, because we all got along, there was never any conflicts. Well, that is the thing if you don't have major conflicts then it is OK to co-operate with other people".

(Interview 19, 170:175)

The avoidance of conflict in the on-line group during the decision-making procedure seemed to be strongly linked to the proper division of labour. Interviewees commented that the equal division of labour among the group members resulted in the absence of conflict in the group.

"No, no we didn't have any conflicts, it is a good group, we don't get any conflicts. We actually allocated all the work equally and everything and went all right. We didn't seem to have any problems on-line or face-to-face but I would say in society in general there is more problems face-to-face than there is on-line". (Interview 03, 248:251)

Therefore, the right proportion of the tasks avoided arguments.

*"Did you have any sort of conflicts/disagreements among the on-line group members?"*

None that I can think of.

*Why do you think that happened, why didn't you have any conflicts?"*

May be because only one person sends away the final written thing, while we've all been putting in how we feel about the activity, and one person has taken it upon themselves and it has worked out all right and evenly. There was no disproportion of the tasks, so there hasn't been any arguments". (Interview 35, 267:276)

## 6.5 DECISION MAKING: DISCUSSION

### 6.5.1 CONTEXT

Data from the interviewees revealed that the group members were faced with three different types of decisions which needed to be made, namely the *Choice of the Topic* under investigation, the *content* of the final group product and the *Division of the Tasks* among the group members. Firstly, the *Choice of the Topic* the group members were going to explore proved to be quite an important decision to be made. Due to the limited number of topics and the existence of other groups who might possibly want to choose the same one, it was felt that this procedure needed to be accelerated, as topics were allocated on a first come-first served basis. In general terms, decision-making in the choice of the topic was reported as democratic. However, in some cases it resulted in arguments and disagreements among the group members.

Secondly, the group decision about the *Content* of the final product was also important. The interviewees needed to decide on the information that was going to be included or excluded from the final product. Interviewees reported something quite interesting in connection with the decision about the topic. It seems that group members, being aware of their peers' tasks, provided them with links and information when they encountered something relevant to their topic, which they would send electronically.

The *Division of Labour* code was initially coded as a separate category. However, as the analysis went on, it became clear that the interviewees themselves were confusing division of labour or tasks with the decision-making procedures. Therefore, *Division of Labour* was placed among the *Decision-making* category codes as a contextual condition. After all, the division of tasks and labour among the group members is one of the most important decisions group participants have to make. It seemed that the group members would follow three patterns in dividing the tasks among them. They either divided the tasks working together as a *group*, or they worked *individually* or they used a *rotation* system.

There were some cases where interviewees admitted to working collaboratively as a group, being aware of the fact that they had to produce group work. However, doing group work means that sometimes the group members need to allocate much more time to the task than working individually. Interviewees reported the performance of group tasks as time consuming. One interviewee admitted that the group used to work together when they could afford the luxury of time. But then, as time limits became tighter and the group members could not afford the time to work collaboratively in each section, they decided to work individually. Therefore, splitting the tasks and doing things individually was reported to be time saving procedure. Group members seemed to work using the following pattern: they

discussed and figured out what the topic needed; decided on the headlines and the structure; split the topic into individual parts. Then, they went away to deal with their topic individually. In the meantime, they exchanged ideas and information on each other's topic and finally they met to put everything together and write the conclusions.

However, there were a few cases of interviewees reporting working in the group in a middle way. They worked neither as a group nor as individuals. It seems that they tried to use what we called a "rotation" system. Group members would split the tasks among them making sure that they took up more tasks than they were supposed to. In this way they ended up handling overlapping tasks. Therefore, they could discuss the overlapping tasks with their peers, compare their contributions and then decide to include the best quality information in the final draft of the group work. Interviewees admitted that working in this fashion assured equal shares of workload and enhanced the quality of their final work.

Additionally, the group members admitted leaving the division of labour to only one group participant. It is not very clear from the data if this person was the so-called leader, or the editor or just one of the group members who had been chosen randomly. Therefore, it seems that the group members did not really have a formal process of identifying a person responsible for the division of labour. This person either volunteered or was simply the leader or the editor of the on-line interaction.

Finally, interviewees reported their need to organise a *Face-to-face Meeting* in order to be able to divide the tasks among the group members, assuring that everyone in the group was responsible for the completion of certain tasks. The explanation given by the interviewees for this was connected to the insecurity of leaving such an important task to be done on-line.

A connection was also found among avoidance of *Conflicts* and proper setting of *Division of Labour*. It seems that lots of interviewees commented that if the division of tasks has been made correctly, and everyone in the group had agreed with it, then this was a way of avoiding conflicts in the on-line group.

## 6.5.2 INTERVENING CONDITIONS

During analysis of the *Decision Making* category a number of intervening conditions were revealed. Firstly, interviewees commented on the *Group Size*. The ideal number of group members needed to be relatively small, approximately 4-6 people, in order to accommodate the needs of the decision-making procedures. If an on-line group got bigger than that, the interaction got really confusing and the group ran the risk of not being able to reach consensus. Interviewees also compared group size in face-to-face and on-line situations.

They seemed to agree that face-to-face interaction allowed bigger numbers of group participants. Additionally, the group size seemed also to be task dependent. A relatively easy task only requires a smaller number of group members. A bigger group could lead to a disproportion of the division of tasks among the group members. Consequently, some group participants would be left with no task to do.

Another interesting finding that was placed with the intervening conditions in the *Decision Making* category dealt with the *Course Design*. The course design seemed to influence the decisions of the group in two different ways. Firstly, if the course co-ordinator had designed the course in such a mode that the number of tasks matched the number of group members, then this facilitated the decision-making procedure. For example, five questions in a group of five can easily be split among the group participants who worked on them individually and finally put their contributions together. Additionally, the interviewees gave another example of how course design can influence decision-making. Interviewees, being aware of the fact that the course was designed on the principles of on-line group learning, admitted doing their best to familiarise themselves with the group learning procedures. Therefore, decision-making was found to be group orientated. A number of quotations have been coded against the code concerning the course design. However, it is believed that it would be worth pursuing research to include more information on the connection among course design and group decision-making procedure in the future.

Another condition influencing decision-making was found to be the code-named *Group Attendance*. The code refers to the frequency of attendance in the on-line group sessions. As not all group participants were present in every case of on-line sessions, those who were, were forced to make decisions on their behalf. As a result of this, the interaction strategy of a face-to-face meeting was chosen, in an attempt to persuade the rest of the group participants to turn up, and compensate for their missing on-line attendance.

Finally, the factor of *Time* was found and coded as one of the intervening conditions influencing the on-line decision-making procedure. Time appears to be coded along with other categories apart from decision making. As group interaction had to take place in predefined *Time Limits* set by the course organisers and co-ordinators, group members realised that they had to effectively manage their time. The time limits had been predefined as *deadlines*, and group members had to manage their actions along the lines of these time limits. It was noticed that the group's efforts became increasingly intense and the decision-making procedure was reinforced as the *deadline approached*. The above can be used as a pattern: the closer the deadline the more intense the group efforts and the closer the need for making decisions were. Additionally, another action taken by the group members needs to be pointed out. It seems that group members, in order to overcome the difficulties of time limits,

set their own deadline in advance. Choosing to set a deadline before the actual course submission deadline gave the group members the luxury of having an extra bit of time to make the necessary changes and corrections in the group coursework. In this mode group members managed to be always on time and on schedule.

### 6.5.3 STRATEGIES

In general terms the decision-making procedure was considered to be group orientated. Interviewees reported a preference for group decisions as opposed to individual ones. Consequently, interviewees reported using group *discussion* in order to reach group decision. The discussion of a group member's personal views and opinions led to the nomination of several propositions and suggestions. Group members put forward suggestions and possible solutions to the topic under discussion with the aim of coming to mutual agreement. However, it needs to be noted that there was not a strict procedure of decision-making that the group members followed. English and Yazdani (1999) have come to similar conclusions in research observing co-operative learning in a computer science course. They found student learning implicit during the decision-making discussions as one student would make a suggestion for the way forward, supported by an explanation of a known process or an anticipated future scenario or problem. They also commented that, occasionally, explanations were requested and given, but this was not common.

However, apart from making decisions in an on-line mode via discussion, interviewees also reported the need for a *Face-to-face Meeting*. The number of quotations linked with this code of *Need to Meet Face-to-face* reveal that the group members would show a preference to meet face-to-face with their peers in order to be able to make a decision. The next step in the analysis became the identification of the reasons why interviewees held such a preference. Firstly, interviewees based their preference on experience. Everyone in the group seemed to be more comfortable, when making decisions in a face-to-face mode. Bearing in mind the fact the interviewees had the opportunity to meet face-to-face as they were living and studying in the same city, they seemed to prefer the old traditional way of making a decision to the complications of such a procedure in an on-line environment. Secondly, interviewees seemed to consider on-line decision-making as time consuming. Group members kept repeating their ideas without being able to reach a conclusion and come to consensus. In comparison, face-to-face interaction seemed to have worked more effectively, therefore once again they showed their preference for meeting face-to-face. Additionally, interviewees reported experiencing problems being able to see and appreciate the overall picture in the on-line environment. As an action, group members chose once again to meet face-to-face.

Dealing with a problem and trying to get an overall view of a situation is pretty important when making a decision. Interviewees reported the inability to achieve an overall picture of a situation, as an important minus in an on-line environment. A more powerful environment allowing students to draw pictures and link ideas could be a possible solution to this problem. Finally, interviewees reported their inability to get every group member involved in the decision-making procedure on-line as another reason for their preference to a face-to-face meeting. In connection to this result Olaniran (1994) found the quality of decisions was higher in conditions where face-to-face and computer-mediated sessions were used in combination. Harasim (1993a) also found decision-making and organising and co-ordinating tasks as part of the teamwork difficult on-line. The rationale provided is the lack of experience in those processes that could be particularly problematic in the on-line asynchronous place. It is interesting to notice that as a solution Harasim (1993a) suggests the "use of real-time communication media such as synchronous conferencing, phone calls, or face-to-face meetings...that would be valuable to the planning and co-ordinating tasks of a group project" (p.128), which corresponds with the findings of this study. She also suggests support by the instructor, customisation of the computer-based environments, provision of guidelines and decision support tools.

Based on the reasons above group members showed a preference for meeting face-to-face in order to make decisions. In general terms reaching *Consensus* was found to be much easier face-to-face than on-line. In connection with the group's preference to meet face-to-face in order to make decisions another interesting comment was made by the interviewees. They reported that they found it easier to collaborate and make decisions with their peers when they were in the initial stages of the decision-making procedure. The initial stages involved minor decision-making such as identification of web pages and links and sending copies of draft work to each other. However, if a task was quite complicated or group participants were at a later stage of decision-making, where more complex decisions had to be made, then they had to meet face-to-face. This is definitely a point that seeks further research. Questions worth pursuing at another level of research: Does complexity of a topic affect preference for face-to-face decision making procedure? Are group members capable of dealing with easy decisions on-line? Do group members prefer face-to-face interaction in order to deal with more complex tasks?

In the action strategies under the *Decision-Making* category, apart from the group making a decision another code was found. Interviewees reported that in some cases the *leader* make decisions on their behalf. However, it seems that the decision making by the leader was purely accidental. Data revealed that the group member with the fastest typing was the one making the decision. This is also a point that needs further research. Data also showed that it

was the leader who made the final decision in some cases. Additionally, it seems that the leader was involved with cases where an urgent decision needed to be made.

#### 6.5.4 RESULTS

The decision-making procedure in the on-line groups seemed to lead to three different results. Group members either had to reach *Consensus*, *Compromise*, or end up having *Arguments* and conflicts. A way of avoiding arguments during decision-making was reported as the correct setting of the division of labour.

In general terms interviewees reported making an effort to reach common ground during decision-making and obtain a group decision through discussion. They demonstrated a preference for group decisions representing the majority of the group members' opinions. The whole procedure of decision making started with a person putting forward a suggestion, then a discussion would follow and eventually all the group members had to agree and reach consensus. Interviewees reported being assisted by the on-line environment in reaching a decision. It seems that the fact that all the information they needed was written on the screen (see *visualisation* code) assisted group members in strengthening their personal arguments and also appreciating the quality of their peers' points. By visually seeing each other's points of view on the computer screen participants managed to group similar opinions and to exclude repeated points at the same time.

Time is also linked as a consequence of the decision-making procedure. It seems that this could be a very time consuming procedure. Group members were easily caught in perpetual repetition of the same ideas. The idea that computer conferencing systems are more time consuming and make it more difficult for the group members to reach consensus in comparison to face-to-face groups appears quite often in the literature (Adrianson & Hjelmquist, 1985, 1991; Dubrovsky et al., 1991; Sproull & Kiesler, 1993; Hollingshead, 1996a). Hiltz et al. (1986) in particular found up to three times as many communication units in the same amount of time in the face-to-face interaction in comparison with computer-mediated communication. Sproull and Kiesler (1993) also found that it takes approximately as long for a three-person group to make a decision electronically and as ten times as long in a four-person group.

On the other hand, interviewees reported having to *Compromise* during decision-making on minor matters, as people's views and opinions always varied. Nevertheless, interviewees reported that they were not annoyed by the fact that they had had to compromise during on-line group interaction because of two reasons. Firstly, they were aware of doing group work. Therefore they were aware of the fact that they had to compromise on certain matters, as this is the way group interaction works. Group members who were not prepared to compromise



cost the rest time and effort. The second explanation given was related to the fact that the group work was taking place in an academic environment. It seems that students were very aware of the fact that they were in an academic institution. Therefore, part of their learning involved experimentation in certain areas, for instance that of group learning. However, it needs to be noted that some interviewees reported that they would be more eager to defend their corner if they had to interact with a group in a working environment.

Finally, the decision-making codes were tested against the *Conflict* codes. Sproull and Kiesler (1993) observing how discussion can lead to consensus in face-to-face and electronic meetings comment that "tendencies to be argumentative and outspoken in electronic discussions may lead to increased group conflict" (p.65). And they conclude that if a decision requires consensus then an electronic group has to work harder to reach it in comparison with a face-to-face group.

Additionally, it seems that conflict as a result of the decision-making procedure in the on-line group is only connected to the choice of topic and no other parameters. It was also discovered that there was a connection among the code of decision making and the *Division of Labour*. It seems that the equal division of labour and proportion of tasks among the group members resulted in the avoidance of arguments within the group.

### **6.5.5 CONTRADICTIONS**

Finally, in general terms interviewees admitted making their face-to-face decisions in a fairly democratic mode deploying discussion and seeking consensus. However, the interesting part of the face-to-face decision-making data revealed the introvert group member's hesitation to participate and express their opinion. Therefore, hesitation in participation means lower quality in the decision-making output.

**CHAPTER 7:**

**RESULTS**

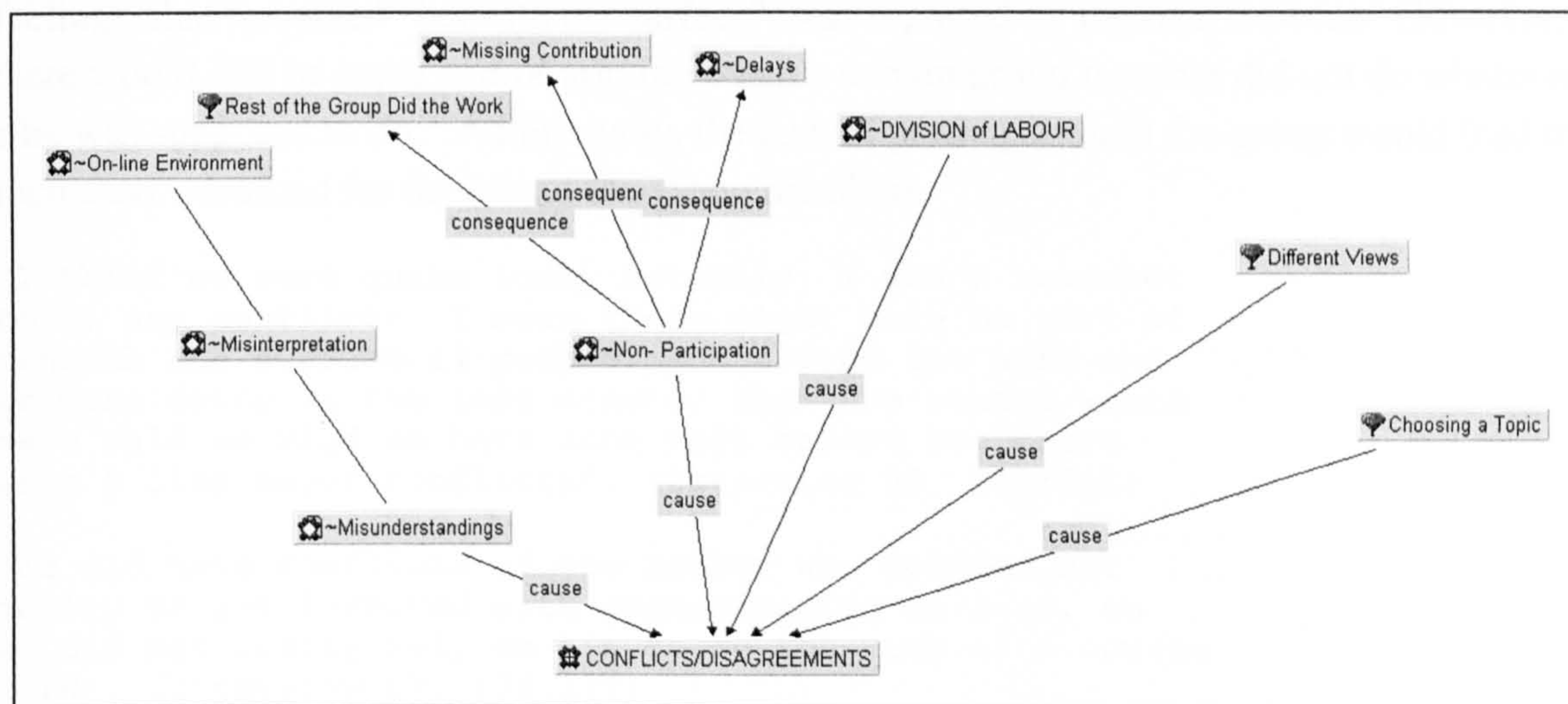
**CONFLICTS AND  
DISAGREEMENTS**

**IN COMPUTER  
CONFERENCING**

# 7. CONFLICTS IN GROUP COMPUTER CONFERENCING

## 7.1 CONFLICTS: CAUSAL CONDITIONS

It should be noted that interviewees did not report major cases of on-line conflicts. However, there were some cases where interviewees admitted having some sort of argument during on-line group interaction. The importance and the level of such disagreements were not very strong. However, the interviewees identified a number of causes, which led to arguments as presented next in Figure 7.1.



*Figure 7.1- On-line Conflicts Causal Conditions*

One of the main causes of on-line disagreements dealt with *misunderstandings* resulting from the way group participants expressed themselves. As presented in the *Expression* category, it is highly possible that the group members misinterpreted and so misunderstood their group participants' contributions. Then misinterpretation could easily lead to conflict. Therefore the misunderstandings and misinterpretations caused by the way group participants expressed themselves in the on-line environment can be one of the causal conditions of an on-line conflict.

"We had lots of conflicts, I think that the main reason what caused them were the misunderstandings. For instance, we post that draft copy of what we did on the web site and some of the students they misunderstood, they thought that it was the final copy of the work, and that we were going to submit it without asking for their consensus. But we actually put it as a draft copy and what happened was that they complained to the supervisor and he got back to us saying that this was not acceptable, that was one of the major conflicts that we had". (Interview 24, 244:250)

"If it was a pure on-line you'd never met the person before and you didn't know them very well, then one person could perhaps write something down in a way that would offend the other person or crack a joke that they meant as a joke but the other person takes seriously. You know, like "oh I can't believe you've done all that work, it's a load of rubbish" but as a joke. You know, someone else might take it you know like a sarcastic joke the other person might say "oh, oh my God, they think it's a load of rubbish". So yeah, I think like misunderstandings from lack of body language and things like that". (Interview 41, 470:476)

One of the other usual causes of an on-line argument is the *non-participation* of a certain group member. This lack of participation would lead to some kind of argument that would not be very strong and major. Instead of arguments, a negative environment and a set of bad feelings, that remained "beneath the surface", was reported by the interviewees. However, there would still be some sort of arguing when a certain group member did not do whatever s/he was supposed to do. Additionally, the lack of participation in the group would lead to increased workload for the rest of the group members.

"I think we were quite lucky actually, I don't remember to be any conflicts. I mean there might have been sort of beneath the surface if people hadn't done the work and we were doing it the last minute, then the others would have said we wish we had done this before but there wasn't like major conflicts". (Interview 09, 244:248)

"We did have conflicts of one member who decided not really to get involved with communicating on-line, so we did not really rely on him to do too much of a course work". (Interview 07, 176:177)

"That would probably cause quite a bit of disagreement. But if they refused to do something, if we've set out the work between us and they refused to do it, it would lead to quite a bit of disagreement probably". (Interview 37, 342:345)

Consequently, lack of participation left the rest of the group members feeling that they had to compensate for the missing contribution. It is quite important to note in the next quotation that the lack of participation was solved by the intervention of the leader who sent an e-mail to the person who would not participate reminding them of the benefits of everyone working together in the group situation.

"Did you have any sort of conflicts among the group members? No, not really. I don't think we did not in our group. There was one lad who didn't do any work for the first two weeks. There used to be only three people of the group each time, the other two would apologise saying we are sorry or whatever. After that I send an e-mail saying look this is our group we mean to work together can we please do so from now on? And it seems that all responded after that a bit more. So, I think the fact that everyone was put behind the same thing, and I said put yourselves together that sort of thing seemed to

work OK. And all felt OK we have to do some work for the benefit of everyone else I think they felt guilty the fact that they were letting down other people so let's do some work". (Interview 10, 200:210)

The lack of participation in the group caused more than a conflict and it resulted in a feeling of missing contributions in the group.

"It did not caused problems to the point that we would flame anybody, we just tried to deal with the situation to just to get on with our work, so basically it is a missing contribution, it was just a blank spot there". (Interview 28, 206:210)

Therefore, in the cases where a certain member would not participate, the rest of the group members lost confidence in the group participant who did not contribute and they decided not to rely on him/her any more.

"We did have conflicts of one member who decided not really to get involved with communicating on-line, so we did not really rely on him to do too much of a course work". (Interview 07, 176:177)

The other group members undertook the extra work caused by this group participant's missing contribution.

"Not really, if you had anyone missing a session now and then it is normal, you can't expect 100 per cent attendance all the time. I didn't cause a problem really - the other three people in the group would do the work". (Interview 37, 332:336)

Interviewees also reported other causes of on-line conflict that were linked to the expression of *different views* on a topic being discussed in the group. The expression of different opinions can cause some sort of argument especially when these opinions differ dramatically.

"No not really, we tended to have similar views on the question we got. I guess that if we didn't have similar views then that could cause disagreements, we'd be more likely to argue more". (Interview 37, 327:330)

"Conflicts is a very common thing to happen in all kinds of groups but it is usually happening in the face-to-face groups. It is much easier to have a disagreement on-line because face-to-face there is always someone who is dominating the group, or is trying to dominate the group. The usual cause of disagreements is the expression of different ideas on how to solve a problem, or getting the answer to each question, so if everyone has different view on how to solve a question then this can lead to arguing". (Interview 39, 281:286)

Additionally, the chances for disagreement become increasingly obvious and more intense as group members are stubborn and are not willing to alter their views.

"I think if someone wasn't pulling their weight or they kept saying the same things and wouldn't alter their views if everyone would disagree with them but we start to get tension if they want to do one thing and everyone else wants to something else. That would probably cause quite a bit of disagreement". (Interview 37, 340:343)

However, arguments by group members over a specific issue is not always perceived as a bad thing. Arguing over something and expressing different ideas can be the start of a very fruitful conversation that will lead to better problem solving or to a better approach towards a specific issue. Additionally, having a disagreement over a certain matter does not necessarily mean having a fight, it can just take the form of an exchange of different ideas over a certain topic.

"It depends again on the persons who are forming the group. I don't remember having a clear leader, it was all who would take the decisions. In the last group work I've done there were all strong minds, because we all got along, there was never any conflicts. Well, that is the thing if you don't have major conflicts then it is OK to co-operate with other people.

*Did you have any sort of conflicts among the group members?*  
One of the main advantages of working in a group is that you have people with different views, and without any conflicts I don't think you have a very successful work. I am not saying that you must conflicts to the point that you start fighting, I am just saying that you should disagree because if nobody disagrees then the project is not very good".  
(Interview 19, 171:183)

*Division of labour* was reported as another possible cause of an on-line conflict. By division of labour we mean the splitting up of the group work into individual parts, so that each group member has equal amounts of work.

When group participants had a clear idea of the task they wanted to undertake in the group that caused conflict. However, when they did not mind what they did no conflict occurred.

"I don't think we ever had any conflicts because we didn't seem to mind which section we were going to do".  
(Interview 15, 178:180)

If group members did not agree with the division of labour then that resulted in tension and in the refusal of doing their part of work as members of the group.

"I think if someone wasn't pulling their weight or they kept saying the same things and wouldn't alter their views if everyone would disagree with them but we start to get tension if they want to do one thing and everyone else wants to something else. That would probably cause quite a bit of disagreement. But if they refused to do something, if we've set out the work between us and they refused to do it, it would lead to quite a bit of disagreement probably".  
(Interview 37, 338:345)

On the other hand, if everything in the group was nicely pre-set and the division of labour was even, that resulted in the avoidance of conflict. In the next quotation the interviewee points out that the division of labour was, in a way, pre-set by the course co-ordinator, therefore group participants did not have to split the tasks among them. There were four different questions to work upon, so each group member took one question and in this way they avoided any arguments.

"Generally, if it was four questions we used to split them between us and try to find a way to answer them, try a way around that. I don't think we really had any disagreements, it was really straight forward. Yes, it was like four people four questions, take one each and then one guided it, everybody would do what they had to do, and then take everyone's contributions and put them all together".  
(Interview 16, 172:176)

Furthermore, the right proportion of tasks among the group members also led to the avoidance of conflict.

"While we've all been putting in how we feel about the activity, and one person has taken it upon themselves and it has worked out all right and evenly. There was no disproportion of the tasks, so there hasn't been any arguments". (Interview 35, 273:276)

A final source of disagreement in the group was reported as being the *choice of topic*.

"Actually when we were choosing the topic we had some sort of disagreement from people wanting to choose another topic, and they would say this better or this is better. But we did come to one decision and then it changed to something else but I cannot remember why, but that was the only thing that was the major problem, the only disagreement". (Interview 23, 210:214)

## 7.2 CONFLICTS: CONTEXT

Initially, when the interviews started the word "conflict" was used to describe any form of disagreement came up during the on-line interaction. However, after a while it was realised that the use of the word "conflict" was inhibiting respondents from giving good quality answers. Possibly the word conflict was perceived by the respondents to be too strong to describe the conflict situation. Alternative words such as "disagreements", "arguments", "misunderstandings", "problem" were chosen to make the interviewees respond and speak about any kind of disagreement that had happened in the group.

One of the characteristics of the on-line group that has already appeared in the *Expression* category is linked with the fact that group participants reported that it was *easier to disagree*

with their peers during their interaction. Group members felt that they were more likely to have a go supporting their arguments.

"On the other hand, you won't feel so bad disagreeing with the other members of the group, so you can get the best decision that way. But I think so people sort of not behave like being themselves when they are on-line, they behave differently somehow I did. So, it could be strange when you finally meet them face-to-face". (Interview 15, 111:115)

"Yes I think yes, personally I think I am more open on-line and more likely to say what I feel, I am not going to extremes but yes I would be more likely to say no I disagree with that than I probably would do face-to-face or at least if I did it face-to-face I would say in a roundabout way or in a certain manner, but I am not so concerned being myself on-line". (Interview 18, 118:121)

"Possibly on-line I think, because face-to-face is kind of, it's there and I think I would certainly be more inclined to have a go at somebody or something over the e-mail or you know on-line than I would face-to-face with somebody. Because even in a conflict on-line it's less of a conflict than it would be if you had the same conversation face-to-face". (Interview 41, 460:463)

As reported group members felt that an argument on-line was less than an argument in a face-to-face situation. Due to the lack of social and communication cues, group participants felt that a fight on-line was never a real fight. Or at least it is a textual conflict that was lacking characteristics of verbal interaction. As a result, dominant group participants were unable to exercise their dominance any more.

"I think it's harder to argue on-line because you ... you ... well I say it's harder, it may be better to argue on-line. I'll explain, OK, it may be harder to argue on-line because you're losing all the non verbal and interpersonal communication but it may be better because if you have two random people arguing on-line, you lose all of the non verbal stuff and if one's shy and one's dominant that's cancelled out. It's just physical typing. It's a typing battle as it were, it's not a "I'm doing to do this. I'm going to do that. We should do that". You lose all of that. One person may have a weak, a different or weaker personality, be shy. And therefore that is cancelled out because, well if they think about it, it's cancelled out. They may still be very timid in what they're typing but in reality all you're getting is the typed message and if you don't know the person. As I say, as long as I think the issues I think are important are actually in there Or some of them, I would not battle strongly unless I ... or have a conflict unless I felt really, really strongly about something. And there's nothing I've felt strong enough at this stage to defend my corner or whatever".  
(Interview 36, 645:659)

Additionally, as depicted in the following quotation, one of the other reasons why a conflict is not really a conflict on-line is linked with the fact that the heat is taken out. Group



participants can use alternative ways of indicating their intentions, like capital letters. However, this is not the same as being face-to-face; group members have to communicate through the "writing a letter" formality.

"Probably easier than it is face-to-face, because all the heat's taken out of it and, I mean nobody can shout at you on-line, it's not physically possible, you can write it in capitals or, you know, you can indicate that you're shouting but I mean it's only really in the words that you say so. I don't know I suppose it depends on the people involved really". (Interview 41, 488:493)

"It can happen, you can certainly have but it's pretty unlikely. Because I think when you're face-to-face the nature of the conversation it's two way, it's discursive, interruptions are allowed, you know, they have to happen really, so that people can you know adapt the conversation that's why it's interactive.....

But I mean it can be quite strong in nature or it might not be. I think because of the nature of e-mails, it's not quite as interactive as it ... I mean you might check your e-mail a few times a day ... er ... but you certainly don't really ... if I e-mailed you something and you disagreed with it and you e-mailed back, I might e-mail one back then we'd settle on it or something. But you wouldn't have like thirty e-mails in the space of an hour like a conversation saying "yes", "no, no, no, no" you know like that. I think it's just people see it as being a bit of a waste of time because you can just type, if you read it on the screen it's kind formal isn't it? (Interview 47, 281:295)

However, interviewees also reported that having an argument or some sort of disagreement in the group is not always considered to be negative. If all group participants had the same views and opinions then the group might not be very successful. After all, it is through the interaction and exchange of points of view that the group managed to have a better outcome.

"Oh yes, yes, this is that I expect from the group, the things that they can make us have a conversation are the disagreements, if everyone agrees with everything, then the meeting time is up and the only thing you do is you go, you do not gain anything through this way". (Interview 22, 522:527)

"One of the main advantages of working in a group is that you have people with different views, and without any conflicts I don't think you have a very successful work. I am not saying that you must conflict to the point that you start fighting, I am just saying that you should disagree because if nobody disagrees then the project is not very good". (Interview 19, 171:183)

## 7.3 CONFLICTS: INTERVENING CONDITIONS

### 7.3.1 ABSENCE OF ON-LINE CONFLICTS

In general terms interviewees reported experiencing no conflicts during their on-line interaction. We had lot of interviewees just answering "no" to the question of having conflicts on-line.

"There was no conflicts what so ever".  
(Interview 03, 235:235)

"Did you have any sort of conflicts among the group members?  
No, not really, never". (Interview 06, 265:267)

However, even after using of different words to convey the meaning of "conflicts" group participants did not supply us with much direct information about possible disagreements in the group. However, closer investigation revealed a number of conditions linked to the absence of conflict.

It seemed that some group participants identified that the equal proportion of division of tasks led to an absence of disagreements. If the *division of labour* is set up correctly among the group members then the reasons for conflicts and disagreements are minimised.

"No, no we didn't have any conflicts, it is a good group, we don't get any conflicts. We actually allocated all the work equally and everything and went all right. We didn't seem to have any problems on-line or face-to-face but I would say in society in general there is more problems face-to-face than there is on-line". (Interview 03, 248:251)

"Did you have any sort of conflicts/disagreements among the on-line group members?"

None that I can think of.

Why do you think that happened, why didn't you have any conflicts?

May be because only one person sends away the final written thing, while we've all been putting in how we feel about the activity, and one person has taken it upon themselves and it has worked out all right and evenly. There was no disproportion of the tasks, so there hasn't been any arguments". (Interview 35, 267:276)

It seems that the conflicts are closely connected to the importance of the work and *level of interest* shown by the group participants. If group participants perceived a group matter as really important then they would stand up for their beliefs, they would even be prepared to have an argument about it. However, if they considered a matter of less importance then they were prepared to leave it up to the rest of the group members without being willing to "fight" for it.

"I don't think we ever had any conflicts because we didn't seem to mind which section we were going to do".  
(Interview 15, 178:180)

The next quotation indicates how the level of interest is connected to the conflicts. When group participants do not share a great level of interest for the group they feel that they do not want to "fight" for their points of view.

"No, there weren't any conflicts, to be honest I don't think that anyone took it that seriously, being like a small part of the course. If it had been more important there would be more conflicts, but as it was there weren't really any conflicts. I suppose there were a couple of times when people suggested me because no-one else has bothered to show up, so if people do not show up then there are no conflicts". (Interview 27, 240:245)

The lack of conflicts during the on-line group interaction can also be charged on the *lack of visual contact* among the group participants.

"No, not really, we didn't have any disagreements, I believe that it is very difficult to have any sort of disagreement in an on-line environment because of the environment itself, you do not see the other people's faces, you do not have visual contact". (Interview 29, 250:259)

One of the other reasons identified by the interviewees to describe why the group members did not feel like having an argument with their peers deals with the *group composition*. A difference in group member attitudes was identified when they knew their peers. They felt that they did not want to disagree with their peers if they did not know them. Additionally, they had to be careful of the way they phrased their sentences to prevent any possible misinterpretation especially from people they did not really know. So, how easy is it to express yourself and have an argument when you are counting your words and being careful of everything you are saying?

"Definitely not in the group, sometimes they didn't actually participate so there wasn't something to have a conflict about, or everyone was just very careful. I mean there were sometimes one or two where there were some jokes, but because we don't know each other we are careful about how we joke and what we say, so there were no conflicts there".  
(Interview 11, 275:279)

*"Did you have any on-line conflicts or disagreements, or misunderstanding or arguments in the group?"*

No, I don't think so.

*Why do you think there was no arguments and disagreements in the on-line group?"*

I don't know, perhaps because we don't know each other that well. I mean we do know each other well but say someone that you've been, if we were in a company and someone you'd been working with for a year or so or a couple of years. You know them really well, you know how they work, you'd be able to turn round and say, you know, you'd pro ... you might have more conflicts. But with someone who you've only just met, certainly face-to-face you're not just going to turn round and say "well I don't agree with what you're saying, that's

a load of rubbish". Because, you know, you're still trying to make an impression on people they're still trying to make an impression on you and at the end of the day you're all trying to get the project done so shouting at each other or, you know, sort of not helping each other isn't really going to get you to the end of the project". (Interview 41, 430:446)

In the code *Work Orientated* quotations referred to the fact that the on-line environment was perceived to be quite a work orientated environment which left no chance for the group members to develop any social relations between themselves. Work orientation was reported to be the reason for the lack of conflict. Interviewees reported concentrating on the task in hand and having no time for socialising. This was another way of preventing conflict.

"I don't think it is actually changing that much, it didn't have a great impact on me, I mean there weren't any major conflicts, there weren't any spectacular interaction, it was just all very normal, very work related. Some other probably felt good, they got the group thing, they've got the task done, especially when a lot of us did contributed bits, that felt like a great achievement".  
(Interview 11, 481:485)

"Sometimes you spend more time when you are face-to-face because you have more conflicts between people because you actually see each other, or maybe you straggle to be the leader and all this kind of stuff. On-line it is more anonymous, you just work in a group and get the work done".  
(Interview 11, 500:503)

Additionally, as the next interviewee noted, the *subject* under investigation in the group and the fact that no-one had great experience of on-line environments, made group participants avoid disagreements. What they used to do was to try to collaborate and "back up" each other in the group.

"No, not really, because we were all quite open minded. None of us had a particular ... because it was such a ... a subject that was so new to us, none of us particularly had like a perfect knowledge of it so we was all using each other to back each other up. I mean we was all asking each other for advice. I suppose if one person had have known it much more, then there would've ... there might've been a conflict because of us just learning it and them already knowing it. But because we was all at the same level of learning it made it a lot easier". (Interview 44, 406:413)

### **7.3.2 CONFLICTS: INTERVENING CONDITIONS**

One of the reasons why group participants would try to overcome any possible problems and disagreements they had within the group when trying to come up with a solution, dealt with the marking system. The main aim of a university course is that the group will get a good mark, providing them with the ticket to pass their modules. Therefore, group participants felt

that they had to think practically about the consequences of possible conflict and try to find a solution, in order to assure the group's function and consequently a *good mark*.

"I think it is very clear, the aims of this course was to get the credits, pass the module. So, I think in this group we all agreed that whatever we discuss, we have to pass the module. This was a core module we had, we had to get good marks". (Interview 22, 265:269)

"If I had more time to do this I would do it in a different manner. As I said before the main aim was to pass this module, so I am quite happy about that. We did lots of thing, we had to work together, we had our disagreements, but we solved everything, the tutor was happy with what we produced. However, from my personal point of view what we did wasn't perfect, but there is nothing perfect in this world". (Interview 22, 285:292)

One of the other factors influencing the strength of a conflict or how long it was going to take until it was solved depended on how near the *deadline* was for group submission.

"I think the only way you can actually do it is at some point someone's got to give and take or you've got to re-discuss the issues. I think there's got to be a lot of give and take in the reassessment. As I was about to say, the fact that you've got to ... it depends how near you are to your deadline or how near you've got to reach your conclusion. If your conclusion is desperate and you need to reach it I think at some point someone would give whereas if it wasn't such a desperate deadline I think it may be possible to go away and we think about, do a bit more research and stuff, and then come back and re-discuss it and then you may have different opinions". (Interview 36, 686:706)

Another condition that came up during the interviews in connection with the *Conflicts* category had to do with the *comparison of a working and educational environment*.

Interviewees reported that they supported their views more strongly when acting in a working environment. On the other hand, they reported that conflicts in the educational environment were not very strong. The explanation given for such an attitude dealt with the fact that the educational environment is considered to be a place where people come to learn, learning then involves experimenting, and learning from other people as well.

"I mean if it was me and I was ... even in our environment we're working in now, not just the fact that things aren't important, but if I could see someone was really, really arguing strongly for their point and they really believed it and I wasn't a hundred per cent standing for my point, I would probably give. Just for the sake of not causing any trouble. But that's the environment we're in. I'm not here to over improve myself at this stage or argue with all my fellow students. In an office based environment, if I felt very strongly I would probably make a stronger stand as it were. But I think in the environment we're working in I think ultimately someone would give because it's all about learning from other people, and letting other people have their say as well". (Interview 36, 697:706)

"As I say, as long as I think the issues I think are important are actually in there or some of them, I would not battle strongly unless I ... or have a conflict unless I felt really, really strongly about something. And there's nothing I've felt strong enough at this stage to defend my corner or whatever. Whereas in a work base environment if you're doing a big project and things and you've got really strong views and you know a lot about the subject and someone else is trying to fob off your comments and things you would stand a lot strongly for it because it's more important".  
 (Interview 36, 656:662)

## 7.4 CONFLICTS: ACTION/INTERACTION STRATEGIES

All the codes relating to the specific actions taken by the group members, in order to solve a possible disagreement or argument were placed among the action interaction strategies in the *on-line conflicts* category. Group members seemed to have employed a number of different strategies when attempting to solve the problems and conflicts caused during their interaction, as presented in the following Figure 7.2.

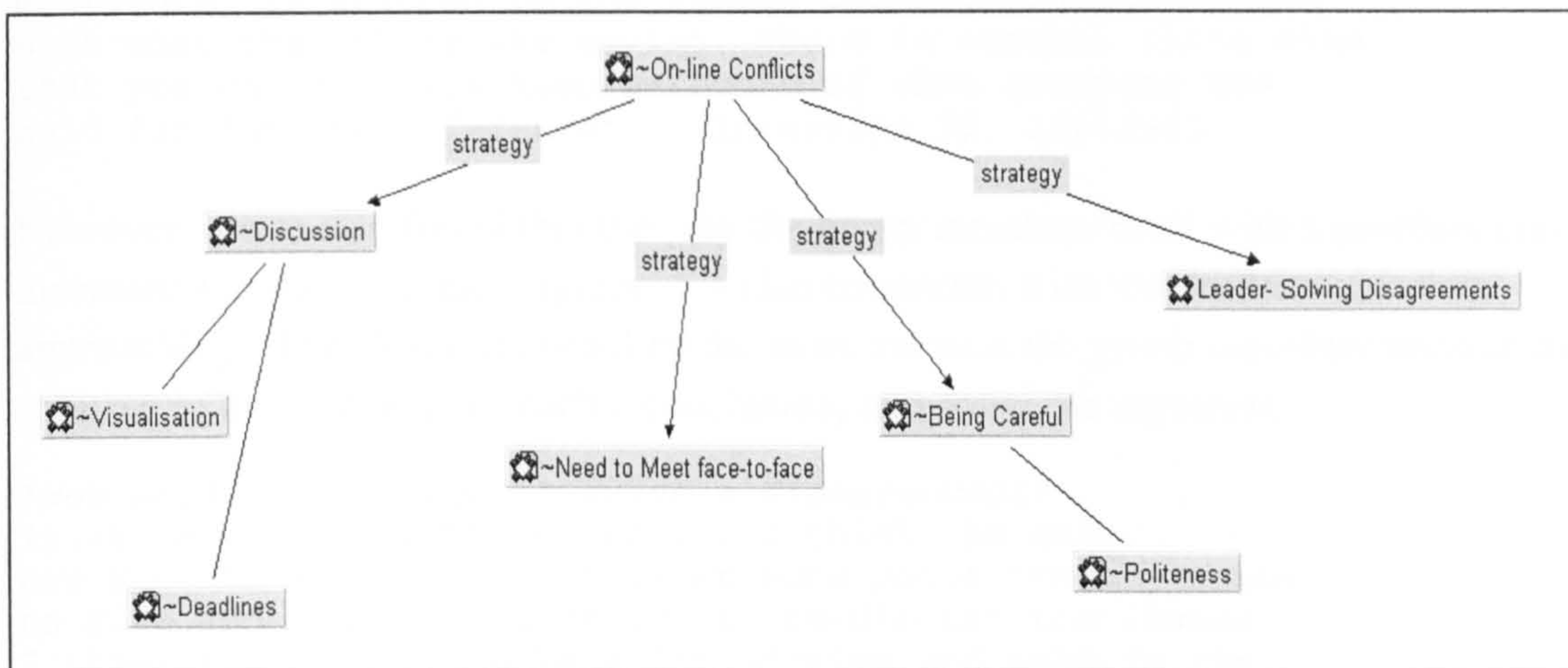


Figure 7.2- On-line Conflicts Action/Interaction Strategies

One of the first ways group members utilised was *discussion*.

"No, it wasn't too bad, I know a lot of other groups had problems but it was pretty smooth. Not really, it's like lack of participation from certain groups, but generally when things came through they were pretty much solved by discussion. It wasn't the case where somebody imposed their view - no one said let's do this, full stop. It was more, I think we should do this, can you tell me what you think, whether this is right or wrong".  
 (Interview 25, 290:294)

Interviewees perceived that through discussion a possible problem with their peers could bring in new refreshing opinions and ideas. The group member's willingness to share their ideas with their peers and to take another person's perspective could only bring positive outcomes. However, group participants had to be willing to take their peers' point of view, and possibly realise that the other group members might be right as well.

"I guess that can be solved by discussing your disagreements. Disagreement is when you feel like acting on way and the other person feel the opposite but by discussing you realise maybe that the other is right, or that your view is more right". (Interview 19, 189:191)

The following interviewee argues that it was easier to argue and support an argument on-line. The fact that everything was written on the computer screen helped group participants to make stronger arguments and at the same time check the statements made by the other group members.

"But on-line I believe that can more easily avoid arguing. Because everything is on-line, it is there on the screen, you can read and understand what everyone is saying. In my group there are only four members so I can analyse my own opinion and the opinions of my group mates, then instead of arguing you just express what you want to say, you take the points of view of other people and based of those you make your points. It has to do with the fact that everything is written on the screen and everyone can check upon what the others are saying. There is another thing also that you can actually keep a record of what everyone has said for further reference". (Interview 39, 286:294)

However, it was also found that the way the group members dealt with a problem and discussed the subject under argument is also connected with the deadline that was approaching. The closer the deadline the more anxious the group members became to find a solution to the problem, to reach a conclusion, and solve the argument.

"How would you manage to solve a disagreement?  
Is it anywhere, anywhere? Er ... I think the only way you can actually do it is at some point someone's got to give and take or you've got to re-discuss the issues. I think there's got to be a lot of give and take in the reassessment. As I was about to say, the fact that you've got to ... it depends how near you are to your deadline or how near you've got to reach your conclusion. If your conclusion is desperate and you need to reach it I think at some point someone would give whereas if it wasn't such a desperate deadline I think it may be possible to go away and we think about, do a bit more research and stuff, and then come back and re-discuss it and then you may have different opinions". (Interview 36, 686:695)

One of the other strategies group members employed in order to avoid or solve conflicts and arguments was based on the fact that they realised that they had to *be careful* of what they

were saying especially because they were acting in an on-line environment (Also have a look once again in *Express* category).

"Did you have any sort of conflicts among the group members on-line?

Definitely not in the group, sometimes they didn't actually participate so there wasn't something to have a conflict about, or everyone was just very careful. I mean there were sometimes one or two where there were some jokes, but because we don't know each other we are careful about how we joke and what we say, so there were no conflicts there". (Interview 11, 274:296)

"You just have to be careful with what you say, just think very carefully before you say something and just try to see things from other perspectives maybe than yours". (Interview 38, 394:395)

Therefore, group members would try to be as polite and kind as they could avoid offending their peers.

"Yes, we did solve the disagreement. However, it is very strange I think in our group we are all very kind, we did not want to say something and offend anybody, we were very quiet. We did not say I disagree with you, or I have another opinion, We did not use these kind of words, instead we said this is My opinion, this is the first draft, if anybody has any problems with it is free to change anything he/she wants". (Interview 22, 231:237)

The next interviewee draws our attention to the fact that the group members were already aware of the net-etiquette and of the attitudes and problems that could be caused by flaming. Therefore, they tried to avoid it as much as they could mainly by being careful of what they were saying.

"I think it was a bit biased in our case because we already have done things on flaming, and we have used the Internet before that, in a lot of course sessions we did flame each other but because we knew what it was we were a bit careful. You just are more aware of the fact that you are doing it because you have been taught about it". (Interview 21, 185:188)

Additionally, group participants have also employed the traditional ways of solving a disagreement by *meeting face-to-face* with group members.

"Definitely helps to meet face-to-face if you have the time to do it, it helps coming across problems - its definitely very useful when the service went down and stuff like that you can go and talk. It would create a bit of a problem if you weren't in the same room". (Interview 37, 472:476)

"How do you manage to solve a disagreement on-line?  
I think the only way of solving a problem on chat



rooms or mail or what have you, I think really is to go back to face-to-face because you really need to see them or to telephone them or ... you really need to meet with them to actually find out what's wrong because you can keep sending them e-mails but they don't have to reply to them so they might completely ignore you. So the only way would be to actually see them face-to-face and make them like sort of face up to what it is that's happening".  
(Interview 44, 449:456)

Finally, one of the other strategies employed by the group members for solving disagreements dealt with the *leader's intervention*. It seems that the group members felt that the leader would have to take some action if there were a problem in the group.

"For instance, if you have a person that is causing a problem the leader has to be very strong-minded, I do not mean punishing but he will have to take some action. If the leader is going to be the representative of the group then he will have to be mentally strong".  
(Interview 40, 255:258)

"I think they vary depending on what you're doing. I mean in our group I just ... um ... let me think I don't know, well we seem to all just be muddling around something, so I just ask everybody what they think and sort of propose an idea and see what they thought about and I mean I don't know if it's just because of my group. Sometimes I've been in groups where everybody disagrees with me but in my group they all seem to think the same so I just like identified what we all thought and then we all did that. And then I kind of, I propose an idea that agreed with all of them, so nobody would get upset". (Interview 44, 334:342)

## 7.5 CONFLICTS: CONSEQUENCES

Conflicts among group members can possibly result in *flaming*. However, it should be pointed out that there were only a few cases of flaming reported by the interviewees. In the next quotation the interviewee admits that she had experienced flaming which had had quite bad results as it had created an atmosphere of negative feelings. In particular, the use of strong language had made her feel a bit threatened.

"Me personally one of the first times I went on-line I have experienced a conflict, I remember I felt very strongly about it and it nearly put me off completely. The thing was I was getting frustrated and I didn't know how to use something or I wanted to know something how to use it, I kind of picked up some name to ask and that person reacted negatively and I was quite annoyed at me, I was very polite I did my best and the person was quite rude and used some strong language, so I was quite taken of that fact because I did not expected that. So, even though it is on screen just a few words, you don't know the person you feel threatened,

you actually feel angry and upset. I felt strange I reacted so strongly even with something like that, it is like I know there is a person behind all that and that is maybe why it make me feel like that. After that the person had the decency to apologise for being rude before because he was involved with something, I found that quite amusing and after that went a lot better knowing that the person wasn't rude he was just distracted with something else".

(Interview 11, 280:292)

However, conflicts do not necessarily result in flaming. Interviewees reported that group participants did not flame their peers very seriously. It was simply that an unpleasant situation was created every time they had an argument.

"It did not cause conflicts the fact that somebody would not contribute to the group, but it did definitely cause bad feelings, which is not the same thing as conflict, conflict means fighting or something. It did not cause problems to the point that we would flame anybody, we just tried to deal with the situation to just to get on with our work, so basically it a missing contribution, it was just a blank spot there". (Interview 28, 204:210)

On the other hand, some of the interviewees had already commented that flaming was facilitated by the lack of visual cues. As interviewees stated, being aware of the consequences of flaming in on-line environments did their best to prevent such attitudes.

"I think it was a bit biased in our case because we already have done things on flaming, and we have used the Internet before that, in a lot of course sessions we did flame each other but because we knew what it was we were a bit careful. You just are more aware of the fact that you are doing it because you have been taught about it". (Interview 21, 185:192)

After discussion, the next step in finding the solution to a conflict would be to *compromise*. Interviewees reported that after a certain period of time, since no results had come out of a discussion among the group members, they had to compromise in both face-to-face and on-line situations.

"I think that this is a very difficult question, I think that in the end someone will have to compromise on something, and that is for both on-line and face-to-face group interaction". (Interview 40, 338:340)

They also commented that being stubborn and opinionated about a certain thing did not help the group to function. They felt that group members would have to compromise eventually if they wanted to maintain a satisfactory level of group work.

"Were you willing to compromise?"

Yeah, well because I've done a lot of group work in college and I know that if you start being stubborn it just causes conflict and then you're not going to achieve anything. So, you've all got to compromise". (Interview 44, 400:404)

Additionally, the level of a group member's willingness to compromise in the group dealt with his/her familiarity with the subject under investigation. If a group participant felt that h/she knew a lot about the subject then this person would not be willing to compromise with the group.

"So, are you willing to compromise in the group then?  
If we are dealing with an area I really know well,  
I will never compromise because I know that I am right, but  
if I have no idea of what is going on then I am willing to  
compromise, it has to do with my familiarity with the  
subject. If it is something that I know well then I will  
have strong opinions but I am willing to compromise if I  
don't know much". (Interview 40, 356:362)

If a certain group participant felt very strongly about a specific subject, then it was the rest of the group members who eventually had to compromise.

"If it was an actual on-line discussion there and then I think ultimately someone would give. I think it also depends how strongly you view the subject and how strongly you feel for your opinion, on your kind of views. I mean if it was me and I was ... even in our environment we're working in now, not just the fact that things aren't important, but if I could see someone was really, really arguing strongly for their point and they really believed it and I wasn't a hundred per cent standing for my point, I would probably give. Just for the sake of not causing any trouble. But that's the environment we're in. I'm not here to over improve myself at this stage or argue with all my fellow students. In an office based environment, if I felt very strongly I would probably make a stronger stand as it were. But I think in the environment we're working in I think ultimately someone would give because it's all about learning from other people, and letting other people have their say as well". (Interview 36, 686:706)

As it is also clear from the previous quotation, things are quite different in a working environment, where people might feel stronger about their points of view. However, in an educational setting things might be changing radically as group participants are more open about other people's opinions and more willing to compromise. In some cases group members managed to reach *consensus* when on-line interaction led to conflict.

"Actually when we were choosing the topic we had some sort of disagreement from people wanting to choose another topic, and they would say this better or this is better. But we did come to one decision and then it changed to something else but I cannot remember why, but that was the only thing that was the major problem, the only disagreement". (Interview 23, 210:214)

"We used the Portugal student's framework, we used my idea, and about the content everyone would find material relevant to what we were looking for. Then I did the final html format because I have technical background, saved it on a disk and we handed it in. Before we sent the final things we sent copies to everyone, they sent us again a

background, but we didn't put a background because I think that the important things is the content, it is not the graphic things. So, we didn't make an effort to design something special for this. Finally, one hour before we submit the work we had a guy who sent us an html file with the background asking us to put it. Of course we didn't bother to do anything the last minute, so we just wrote an e-mail saying that the final work was defined and we didn't want to change a lot. We didn't say that we didn't want to change anything, we weren't that negative, we just said that we didn't want to change a lot".  
(Interview 22, 273:283)

"We had lots of conflicts, I think that the main reason what caused them were the misunderstandings. For instance, we post that draft copy of what we did on the web site and some of the students they misunderstood, they thought that it was the final copy of the work, and that we were going to submit it without asking for their consensus. But we actually put it as a draft copy and what happened was that they complained to the supervisor and he got back to us saying that this was not acceptable, that was one of the major conflicts that we had". (Interview 24, 244:250)

## 7.6 CONFLICTS: CONTRADICTIONS

During the analysis of the code of *On-line Conflicts* we coded a number of quotations under the name of *More Likely to Disagree*. Quotations referring to the cases where group participants reported being more likely to disagree with their peers were included. Closer examining of the quotations revealed a few cases where the group participants were not only more likely to disagree but they were more likely to argue, and cause conflict. Therefore, a new code named *More Likely to Have an Argument* was created. Paying extra attention to the quotations linked with the above showed that all of them were linked with a face-to-face situation.

"When you are face-to-face you've got like, if you disagree with someone you are more likely to speak and then you can argue more easily". (Interview 05, 184:185)

Conflicts mainly arose from discussion and the expression of different views by group participants. The expression of different views can lead to arguments and conflicts.

"Because you have different opinions coming up, and sometimes you have to find which one you want, which one you don't want, so you might not really conflict, but you kind of argue, discuss, you give your opinion and that might cause some arguing". (Interview 26, 240:243)

However, expressing different views and having different opinions is not always considered to be negative for the group. It can turn into being a very creative force for the group.

Problems only start when group participants with very strong opinions are not willing to negotiate their points of view and come to a consensus.

*"Are you more likely to have disagreements in the face-to-face group or in the on-line?"*

I'm not quite sure about that. I suppose you could have yeah, because I've been in a group before where one person was really, really stubborn, and I just ... just couldn't ... couldn't find any way of resolving it at all, and neither could anybody else in the group. There was no way at all to resolve it. But it was more to do with his attitude than what he said. So I suppose on the on the computer you wouldn't get the attitude, you'd just get his contribution which would be fine so I think there might be more room for conflict on face-to-face". (Interview 44, 415:422)

*"Hypothetically, what sort of things can cause a disagreement in an on-line group?"*

I think if someone wasn't pulling their weight or they kept saying the same things and wouldn't alter their views if everyone would disagree with them but we start to get tension if they want to do one thing and everyone else wants to something else. That would probably cause quite a bit of disagreement. But if they refused to do something, if we've set out the work between us and they refused to do it, it would lead to quite a bit of disagreement probably". (Interview 37, 338:345)

Additionally, the expression of dominance of certain group participants in the on-line interaction can easily lead to conflict.

*"Conflicts is a very common thing to happen in all kinds of groups but it is usually happening in the face-to-face groups. It is much easier to have a disagreement because face-to-face there is always someone who is dominating the group, or is trying to dominate the group. The usual cause of disagreements is the expression of different ideas on how to solve a problem, or getting the answer to each question, so if everyone has different view on how to solve a question then this can lead to arguing". (Interview 39, 279:286)*

Furthermore, another possible cause of face-to-face conflict was reported as interruptions made by dominant group participants. During the face-to-face group interaction there is a possibility that the most dominant group members will interrupt the rest of the group. Such interruptions can easily result in an argument.

*"I think when you're face-to-face the nature of the conversation it's two way, it's discursive, interruptions are allowed, you know, they have to happen really, so that people can you know adapt the conversation that's why it's interactive. But at the same time every time somebody interrupts it's a potential conflict isn't it? Every time someone says something and just makes a sweeping statement and then carries on talking, you might disagree with somebody and then they might just put their hand up and then say "well I disagree" and that's a conflict, it might not be a particularly strong conflict". (Interview 47, 281:290)*

## **7.7 CONFLICTS: DISCUSSION**

### **7.7.1 CONTEXT**

One of the most important statements made by the interviewees dealt with the revelation of their intention to disagree with their peers. It seems that the interviewees admitted being more keen to disagree with their peers and support their arguments when they were on-line. The reasons given for such an attitude dealt with the nature of the on-line environment. Due to the lack of social and communication cues, group participants felt that a conflict on-line was never a real conflict.

As revealed by the interviewees a fight on-line took the form of a textual conflict that lacked all the characteristics of a verbal interaction, as the "heat" of the face-to-face interaction is absent. Group participants may use different ways of indicating their intentions but the level of conflict is never the same as in a face-to-face situation. They only have to "fight" with words and to communicate through the "writing a letter" formality. The role of the absence of social and communication cues in connection with the expression of uninhibited verbal behavior in computer-mediated communication has been discussed in the literature (Collins, 1992). However, in the literature the lack of social and communication cues is linked to negative outcomes such as the encouragement of misinterpretation and miscommunication (Schaefer, 1997; Brouwer, 1997; Berge, 1997; Moore, 1993). On the contrary, data from our interviews gave a positive aspect in the lack of communication cues in this case, as group participants were more encouraged to disagree with their peers and express dissimilar opinions. After all, the expression of various opinions among the group members can bring positive outcomes.

### **7.7.2 CAUSES**

It has to be noticed that in general terms, interviewees did not report instances of major arguments and conflicts during their on-line interaction. Even in the cases where the interviewees reported having some sort of argument, the importance and the level of such disagreements was not considered to be very strong. However, interviewees identified a number of causes of on-line arguments. The most important one was misunderstandings caused by the way group participants expressed themselves. Due to the lack of social and communication cues group interaction could lead to misinterpretation of someone's words and then eventually to misunderstandings and conflicts. The literature also finds misinterpretation caused by the text-based nature of computer conferencing as a reason why people "flame" (Wang, 1996; Shapiro & Anderson, 1985; Berge, 1997).

Additionally, the *Lack of Participation* of a certain group member was reported as another reason leading to arguments. Lack of participation could also lead to the creation of a bad "atmosphere" among the group participants and a greater workload for the rest of the group. Consequently, the lack of participation left the rest of the group members with feeling obliged to compensate for the missing contribution.

Another common reason for a disagreement in the online group interaction was the expression of *Different Views* on a topic being discussed. The more unwilling the group participants were to negotiate their views the more chances for an intense disagreement arose. However, it was noted that group members arguing over a specific issue could also be the start of a very fruitful conversation that could lead to a better solution of a problem.

An additional possible cause of disagreement in the on-line group came up when group participants had to decide on the topic they had to take upon. The procedure of *choosing a topic* for the group could possibly result in arguments.

Finally, another source of disagreement was found to be the *Division of Labour*. It seems that when group participants were particularly concerned with the task they were going to undertake in the group, therefore they were willing to "fight" for it. In other words, the division of labour as a cause of on-line conflict also depends on the level of interest of certain group participants in undertaking certain tasks. However, it seems that if the division of labour was evenly pre-set, then conflict in the group could be avoided.

### 7.7.3 INTERVENING CONDITIONS

The intervening conditions were divided into two groups, the first one containing all the conditions under which the group participants would avoid having a conflict, and the second one dealing with those that could lead to conflicts. A closer investigation of the quotations related to the non-occurrence of conflicts during the on-line interaction revealed a number of conditions that, if met, precluded on-line conflicts. Initially, the *equal proportion of tasks* among the group members was a vital condition leading to fewer disagreements. The prevention of disagreements was also connected with the *Level of Interest* the group participants share for the project they undertake. A low level of interest leads to less interest in having an argument. Additionally, the lack of conflict during the on-line group interaction can also be attributed to the lack of visual contact among the group participants.

One of the other reasons identified by the interviewees as a condition for the absence of on-line arguments dealt with the *Group Composition*. It seems that there is a difference in group member attitudes when they know their group participants. Group participants do not feel

that they want to disagree with their peers if they do not really know them. Additionally, they have to be *careful* of what they are saying to prevent any possible *misinterpretation* of their words by people who do not really know them.

Group participants, because they do not know each other, feel that they have to be careful of what they are saying (this is also linked to the way group participants felt that they had to express themselves during the on-line group environment). They felt that they did not want to disagree with their group members if they did not know them, they felt that they had to be polite, keeping in mind that that they should not offend anyone. This result seems to be supported by Smolensky et al. (1990) who examined uninhibited verbal behaviour in combination with the level of acquaintance among group participants using CMC. They found that the amount of uninhibited behaviour among group participants who knew each other was higher. However, the remark seems to disagree with McCormick and McCormick (1992) and Orlikowski and Yates (1993) who found that flaming was limited by the familiarity among the group members.

The analysis also identified a strong connection between the codes of *On-line Conflicts* and the code-named *Work-Orientated*. It was found that one of the other reasons why there were not so many conflicts in the on-line environment is the fact that people perceived it as work-orientated. Group participants were interested in getting their work done when they were on-line, not in socialising. Another condition also found in connection with the lack of conflict among the group members deals with the fact that the most of the group participants did not have any experience of on-line group interaction. Therefore they put aside any possible conflicts and they tried to collaborate.

On the other hand, the interviewees identified a number of intervening conditions linked to the existence of on-line group conflict. Initially, one of the conditions found to interfere with on-line group conflict deals with the *marking system*. Group participants reported that they had to think practically about the consequences a possible conflict could have for the group, therefore they felt that they had to try to find solutions to the argument in order to assure the group's function and consequently a good mark.

One of the other factors influencing the strength or the duration of a conflict depended on how near the *deadline* was for submission of the group project. The nearer the deadline the more desperate the group participants were to solve the disagreement. Additionally, interviewees admitted supporting their views more strongly if they were in a working environment. On the other hand, interviewees reported that conflicts in the educational environment were not very strong. The explanation given for such an attitude deals with the fact that group participants perceived the educational environment as a place where they came to learn, learning then



involves experimenting, and learning from their peers. Therefore, conflicts can be a matter of context, as they can be avoided if group participants are not feeling antagonistic towards each other.

#### **7.7.4 STRATEGIES**

When the group participants had an on-line conflict they tried to solve it by employing a number of strategies. They reported that one of the strategies group members used in order to try and solve a disagreement was discussion. It seemed that group participants were willing to *discuss* and share their views and also take their peers' perspective. Additionally, it seemed that the on-line environment helped group members to appreciate and then support a given argument. The fact that all arguments were written on the computer screen helped group participants to visualise their personal and their peers' thoughts.

One of the other strategies group members employed in order to avoid any possible conflicts and arguments was based on the fact that they realised that they had to *be careful* of what they were saying. Therefore, as a strategy, group members tried to be as polite and kind as they could, avoiding offending the other group members.

Additionally, group participants also employed the traditional ways of solving a disagreement by *meeting face-to-face* with their peers.

Finally, one of the other strategies group members employed for solving disagreements dealt with the *leader's intervention*. It seems that group members felt that the leader had to take some action and solve any possible disagreements, which arose during the on-line group interaction.

#### **7.7.5 CONSEQUENCES**

In some cases group members managed to reach *consensus* during their on-line group interaction that had led to conflict.

In other cases the conflict among the group members resulted in *flaming*. It should be noticed that only a few cases of flaming were reported by the interviewees. The majority of the on-line group conflicts did not result in flaming, as group participants were already aware of the disastrous results the expression of such negative attitudes can have for group interaction.

Interviewees also admitted having to *compromise* after discussing argumentatively about a possible conflict. Interviewees commented that being stubborn and opinionated about a

certain issue would not help the group to function. All the group members had to compromise eventually if they wanted to maintain a satisfactory level of group work. Furthermore, interviewees connected the level of a group member's willingness to compromise during the on-line group interaction with his/her familiarity with the subject under investigation. If a group participant felt that s/he knew a lot about the subject under investigation then this person was not be willing to compromise in the group. This perception expressed by the interviewees seems to be supported by Ross (1996) who found group participants with prior knowledge more willing to engage in arguments.

The interviewees also commented that they might be more interested in supporting their views more strongly if they had been acting in a working environment. Sudweeks and Allbritton (1996) also argue that task focus and clearly defined organisational structure seem to affect communication and conflict among group members.

# **CHAPTER 8:**

## **RESULTS**

**ISSUES OF LEADERSHIP**

**IN COMPUTER**

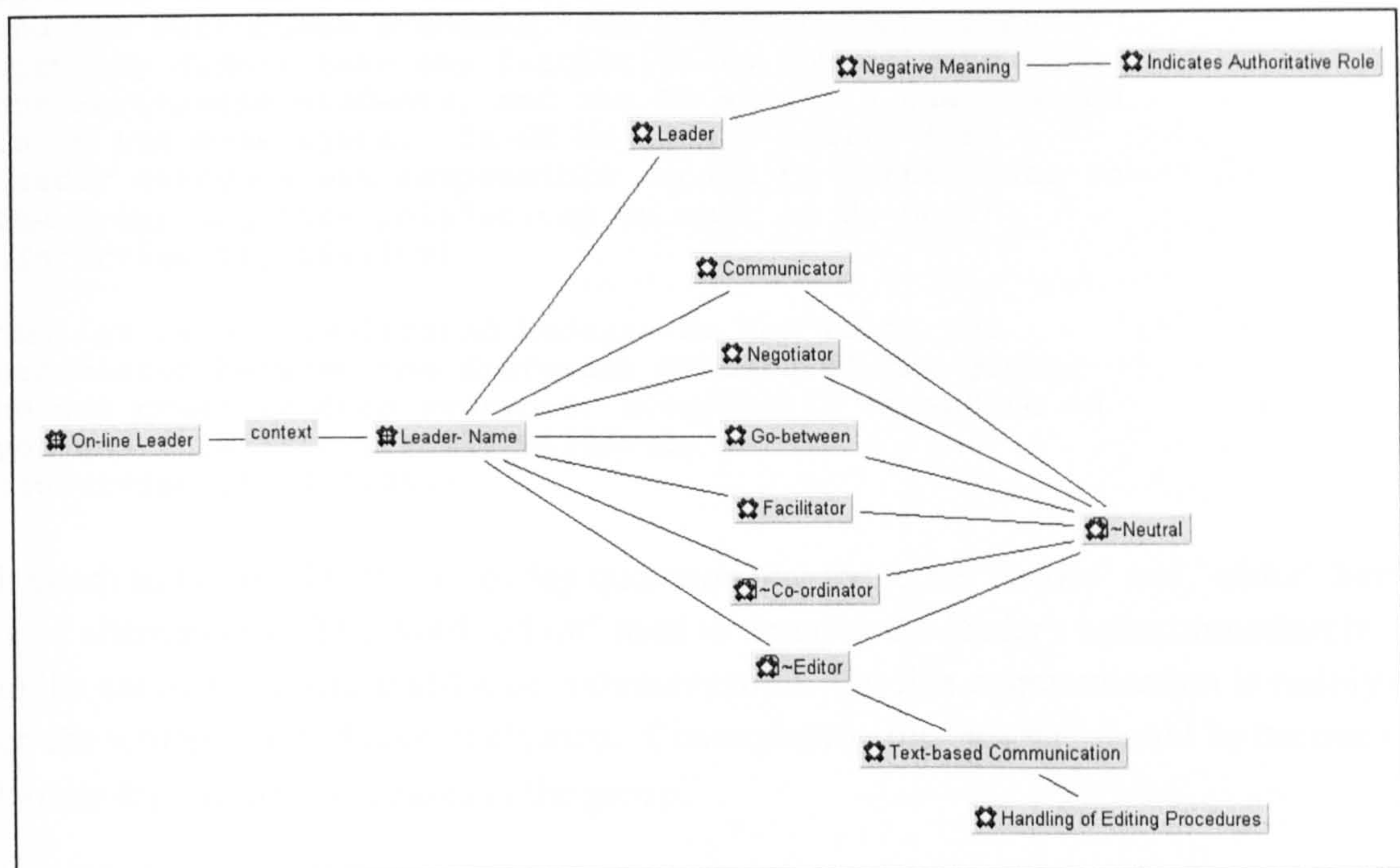
**CONFERENCING**

# 8. LEADERSHIP IN GROUP COMPUTER CONFERENCING

## 8.1 LEADERSHIP: CONTEXT

### 8.1.1 LEADER: NAME

During the interviews when asking questions concerning leadership we attempted not to use the word "leader". Hence, alternative words such as "facilitator" or "co-ordinator" were used, always giving the choice to the interviewees to select the word they would think as being the most appropriate one to describe such person who took up certain responsibilities in the on-line group. The reason why we tried to follow such strategy, not using very strong words describing the leader dealt with the nature of the word that could probably enforce a negative meaning. Thus, it has to be noted that interviewees did not particularly prefer the use of the word "leader" themselves. Alternative words such as "co-ordinator", "communicator", "go-between", "facilitator", "negotiator" were used instead, as presented in the next Figure 8.1.



*Figure 8.1- Leader's Name*

Interviewees showed a preference in using the word "co-ordinator", indicating a wise decision in our opinion, as the word "leader" could give a negative meaning at the whole process of leadership. The following quotation successfully illustrates the group members' preference not to call the facilitator a "leader", as the word could indicate the authoritative role the possible "leader" assumed in the group.

"If you give this title to a person during a discussion or when the group has a certain task, this person would feel that he/she is not only the co-ordinator but the leader. So, this person would feel in a way superior. You might not have mentioned the word leader but the person automatically would feel differently and would interact with the group differently". (Interview 22, 174:180)

However, the word "co-ordinator" is considered to be quite neutral, and it expresses successfully the tasks needed to be performed.

"Mostly, I think he or she should be the co-ordinator, and the communicator, you need someone to inform the group about all the things that have been done, about the progress of the entire project". (Interview 24, 188:190)

"I think that the existence of a person that I wouldn't call a leader, I would call him or her a co-ordinator is pretty essential". (Interview 29, 166:168)

Other words have also been used such as go-between and negotiator.

"We didn't really form a leader but it seems that the UK students formed some sort of a go-between among the Greek and the Portuguese students, the Greek students they actually didn't take any initiative to communicate with the Portuguese students, and the UK students they seemed to be the messengers. In UK we didn't really form a leader everyone was responsible enough to participate in the group and take initiatives on what to do next". (Interview 24, 164:169)

"No, it is so complicated because he had to be the negotiator between the different members of the group, he got pressure from everyone. Everyone is depending on you and this is extremely difficult". (Interview 26, 277:281)

It needs to be noted in the following quotation that the terms "leader" and "editor" have been used alternatively. The word "editor" used to describe the leader's tasks immediately connects to the nature of on-line text-based communication. On-line communication is mainly based on the written form of communication. Consequently, the "leader" would be the one to handle the editing procedures in the group.

"I think that familiarity with computers is a very important factor that would make someone the on-line leader, because when someone seems to know a lot about computers that gives to the other members of the group an impression. In our case though I cannot tell that the co-ordinator had a great familiarity with the computers, the truth is that we all contributed something different in the group, in our case the co-ordinator was more of an editor, everyone participated in their own way, and the leader took everyone's contributions, he put them all together and then he sent the things back to everyone to approve it or disapprove it". (Interview 29, 205:215)

"Yeah I think an editor is a better word for an on-line environment. I think because the fact you're actually editing the text as it were rather than actually leading a discussion. Editor is a better way of describing someone who would edit or lead in an on-line environment. In a face-to-face group discussion you have got a leader or chairperson who's actually leading and focusing the direction. In an on-line environment like the one we've been working in our co-ordinator is actually more editing our thoughts. Obviously they are cutting down some of the information but they tend to be bouncing it back at us. Whereas a leader in a group discussion face-to-face would actually try and point the direction a bit more". (Interview 36, 559:566)

## 8.2 LEADERSHIP NEED: CAUSAL CONDITIONS

In the *Leadership Need* code, as its name indicates, all cases where interviewees mentioned a necessity for a leader in the on-line group interaction have been included. A careful comparison of the quotations in this code led to the realisation that a co-ordinator/leader is important for the success of the on-line interaction. Additionally, it revealed a number of causal conditions relating to why a leader would be needed. Paying closer attention to quotations linked to the *Leadership Need* code, a relevance to the codes of *Time Management* and *Need for Organisation* were detected. Interviewees reported that the on-line interaction proved to be a time consuming procedure if there was no leader present in the group.

"It definitely takes longer I think unless you get someone from the start to be the leader right from the start, in that case it would probably take about the same amount of time. It is harder to know exactly what the other person is doing". (Interview 27, 121:124)

Thus, the leadership need arose from the realisation that lots of *time was being wasted* in group interaction. Group members wanting to save time and come up with the idea of creating a leader, who would take all the necessary action to prevent a further waste of time.

"We didn't really choose him, I suppose it was me, we didn't really say I am the leader, we kept saying why don't we do this and then we were just assuming that everyone was doing that rather than making sure they were. So, no work was getting done, and then we realise that we were wasting lots of time and we were not going anywhere so we realise that someone should take the lead". (Interview 27, 182:188)

On the other hand, data revealed that the leadership need became even more evident as the deadline for the submission of the group's work approached. At the initial stages of the on-line group interaction there was no realisation of a leadership need. However, as the *deadline approached*, students felt that they had to become more serious about the way they were

handling their group. Becoming more serious meant partly that they had to select a person to handle the on-line group interaction, helping group members to become more focused.

"I think it was more evident in the on-line situation that we needed Simon as leader. At the very start we didn't have a leader, and I think at the beginning we just thought the deadline, but as the deadline was only a month away it was when we knew that we had to get down to work seriously, then we thought we do need someone to keep the group on track, does anyone mind doing it, and someone sort of volunteered and after we had a discussion we seem to sort of agree that Simon would handle the whole thing quite well, and he would carry on doing what he did, and he seemed to be OK with that, and I think it helped very much the group both on-line and face-to-face". (Interview 09, 270:285)

In the next quotation the interviewee also admits that the need for a leader became more evident as the deadline approached. The realisation that certain tasks needed to be done before the deadline, made the interviewee take upon himself the role of leader and start organising things, such as sending e-mails to the rest of the group members and looking for references on the topic under investigation.

"But then, near the end it happened more individually, somebody would be more dominant and somebody would be picked up and would carry on. And somebody would put all the comments together, such as cutting and pasting things together. And then we needed more of organisation, and later towards the end of the deadline I decided that if anybody wasn't doing anything about writing a report then I would do it. And actually, finally I managed to get a hold of the people, because it was a dead period over Christmas where no so many people were around, and I just manage to get on with that and just let people know, and I tried to send e-mails to people regarding literature on our topic and references and stuff". (Interview 28, 228:241)

In the next quotation, it is clear that the need for a leader became more evident as the deadline approached. In this specific quotation it can also be seen that there was a *need to organise the tasks* within the group. This necessity also led to the realisation of the need for an on-line leader.

"I am not so sure because maybe that times when you act as a member of a group isn't as such as if you have to only have face-to-face, so there is no e-mail no nothing in the traditional way, then it would have been more of a problem to actually trying to get everyone together, you need organisation, and the leader all the time who has to contact everyone and make timetables, so in that sense this required to spend less time as a group, which I felt wasn't actually that bad, the group still functions". (Interview 11, 415:420)

Another parameter found and placed among the causal conditions in the *Leadership Need* code deals mainly with the *asynchronous mode* of on-line communication. During the

asynchronous mode, when group members *sent inputs and contributions at different times*, a greater need for organisation was reported.

"I think with the on-line communication you need someone to sort of organise other people because of the way e-mail and on-line communication works. Because everyone is sending e-mails at different times you sort of lose time. Someone could say to someone else do you want to do that and at the same time that person could send something to someone else saying would you like to do that. And unless someone actually assumes a position where they can organise someone else then it doesn't really work". (Interview 10, 227:233)

"I think I was very interested because mainly up to then the only time I would communicate on-line was with friends only by e-mail on an individual basis and then I was interested on how, if I had to communicate on-line to more than one person and then we would try to organise something in a group basis on-line and if that would work. Because if you send an e-mail at any time I would like, then there would be problems of someone sending a message at this point and someone sending the same message or a different message at the same time. And then you don't actually answer each other's questions because.....Well I think fairly soon, almost straight away since we started to do things because I think partly I assumed to take the position to say you do that you do that. And if there were people who wanted to co-operate that was fair enough but there seemed to be people who wouldn't like to rush into it and they would go, oh no we have to do we have to do that and they just sort of waited until someone else said it but because someone said do you mind doing this then it sort of worked OK". (Interview 10, 256:268)

### **8.2.1 LACK OF LEADERSHIP NEED: CONDITIONS**

Initially, the code *Leadership Need* was examined with the aim of identifying the reasons why on-line group members perceived it important to create a leader in the on-line interaction. However, there was another code labelled *Lack of Leadership Need*, where all the quotations referring to the cases where interviewees acknowledged the fact that there was no need to create a leader on-line were included. As already determined in the *Leadership Contradictions* section, there was a strong relation between this code and the code of *Face-to-face Leader*. However, some of the quotations would still refer to the on-line leader. Closer attention to the quotations linked with the *Lack of Leadership Need* revealed a number of conditions linked to the realisation that there was no need for a leader in the on-line group.

The most important conditions influencing group members' attitudes towards a possible leader focused on the existence of a *group* that was considered to be *co-operative*. If group members seemed to care about the group and were willing to co-operate with each other, then



the necessity to create a leader faded away. Therefore, if the group members are enthusiastic about the group work and are willing to co-operate with each other then there might not be a need for a leader in the group.

*"Did you form some sort of a leader in the on-line group situation?"*

Not in my group.

*How did you co-operate with each other then, what would you do?"*

You just get a feel for it, for the activities for each week, you just get by.

*However, you have to find a way to communicate each week, how do you do that?"*

I did the activities the second week or so and then another person would do it for the next week. I think it's not like we're telling someone you do it, it's like people felt like taking it upon themselves no-one is telling us what to do, we are just getting a feeling for it, we are just going week by week, and it is just working all right".

(Interview 35, 217:231)

*"Did you form some sort of a leader?"*

Everyone was on charge of things, I found that my group was very co-operative, everyone wanted to compile the whole things or lead the on-line discussion or resume the discussion's outcome and send it to the course co-ordinator, most of us we were willing to do that.

*However, did you form a leader?"*

I had a leader for the face-to-face but not for the on-line situation". (Interview 14, 102:111)

It is of interest to see in the next quotations how a co-operative group is described. Signs that group members were being responsible, and were willing to get involved in group's tasks were a way of eliminating the need for an on-line group leader.

*"We didn't really form a leader but it seems that the UK students formed some sort of a go-between among the Greek and the Portuguese students, the Greek students they actually didn't take any initiative to communicate with the Portuguese students, and the UK students they seemed to be the messengers. In UK we didn't really form a leader everyone was responsible enough to participate in the group and take initiatives on what to do next".*

(Interview 24, 164:169)

As presented in the next quotation, group members needed to be responsible enough to participate in the group. The next interviewee also connects leadership with the *familiarity with technology*.

*"Um ... no not really ... er ... I'm trying to think. Er ... no I mean there was two that talked a lot but only really because every time we've had a practical session they've got on-line first. So they started off having a conversation, and because nobody else was on-line they would just chat about anything. They wouldn't be chatting about the work. So whenever someone else came on-line it was always like "oh there you are" you know "where've you*

been? We've been chatting". And then they'd carry on their conversation so there wasn't really a leader but there was perhaps people who were more involved in the technology and in being on-line, only from the experience that we've had here though". (Interview 41, 262:271)

Another condition that eliminated the need for a leader was the group members' experience of group working. In the next quotation the interviewee notes that, as the group consisted of postgraduates who already had *experience of group work*, there was no need for a formal leader.

"You know because all of us we were postgraduate students, or we had quite a lot of experience about group working, so I think that there was no need for a formal leader in the group. However, in some cases there is a need for a leader to have a strong opinion and to represent the group outside the group. For example, if we need an extension, or we have a problem in the group like some people do not participate as they should, or leave the group. In these sort of cases we need someone who can speak and represent the group". (Interview 22, 163:170)

Another reason why there was no need for a leader in the on-line group dealt with the *equal contribution* of all group members. If group members contributed equally to the group, then there was no need for someone to co-ordinate the group interaction.

"Do you believe that there is a need for a leader in the on-line group situation?

We didn't have a leader - we were just all sort of talking to one another and everyone contributed to the discussion. We never had one set leader who would say right enough of that question go on to the next one. Although one or somebody would say, OK we've discussed that one we'll go on to the next question now, but it was different every week. Sometimes I would say OK we'll go on to the next question or sometimes one of the others would. There was no one telling everyone, we'll discuss this or do this or do that.

Did you feel the need for someone to co-ordinate and organise the group though?

No we don't have anyone like that in our group.

We all sort of got on-line ourselves and just started discussing individually. Sometimes if there was only two of us on-line we just discuss for a little while by ourselves until the rest of us came on and then everyone just contributed evenly, there was no one who would co-ordinate the conversation one way or another, or co-ordinate everyone to do one thing or another".

(Interview 30, 179:195)

Another reason why there was no need for a leader was mentioned by the interviewees. The reason related to the way an *academic environment* works. Some interviewees noted that there was no need for a leader in a learning environment, as everyone was perceived to be equal, so there was no need for someone to give directions and judge the other group members. After all, in a learning environment students need to experiment and learn for themselves by experimenting.

"Apart from these cases though I don't think that there is a need for a leader because we are just learning, we are in a learning environment, we are not working in a professional organisation, we do not need somebody to say you should do this, or you should not do that, and somebody who would judge everything you are doing". (Interview 22, 169:172)

Apart from the reasons why there was no need for a leader in the on-line group, interviewees reported some other conditions on which leadership necessity depended. They noted that there was no need for a leader if the *group size* was very small, between 2 or 3 people. However, they reported that, if the group became bigger than that then a need for someone to organise and co-ordinate tasks in the group arose. In the next quotation the interviewee describes how the on-line interaction actually took part between him and another group participant. However, he notes that if the group became larger then someone emerged naturally from the group to co-ordinate and summarise the contributions.

"Yes I think it's true - it really depends, because, my best friend is kind of interested in the same things as I am so when I have an assignment I bounce ideas off him and he'll do the same to me. So there's no leader - it's like a think tank but there's no real leader there. We're just quite structured in our thoughts and bounce things off each other and generally that's fine, but whenever there's maybe more than 2 people at the same time, I think - I don't think it's asserting a dominance I think it's just naturally someone will come up as being a little bit more enthusiastic or something about it, and people maybe look to that person to get the ideas together".  
(Interview 25, 128:135)

As the next quotation reveals leadership necessity is also *task dependent*. As soon as the group members had easy tasks to perform then they felt that they could manage without a leader. However, as the task reached completion then the group members were presented with two alternatives. They either chose to meet face-to-face, if they had a chance to do so, or they decided to assign a leader. Therefore, the creation of leader is task dependent.

"I suppose it would be defined by the group really. So if the leader offered to do this, do this, do this and the rest of the group said "fine you do that" and then they didn't do it, then the rest of the group's probably be like "yeah, but you said", "you were going to research that or whatever". However, I don't think necessarily on an on-line group you need a leader, because if there's three people that are, you know, quite good with computers then I mean, for example, that time that I wasn't logged on three people had e-mailed me to say "where are you?". So it wasn't just one person and they were all sitting next to each other so they could've said "oh" you know "I'll send him a message" or "will you send him a message?" But they all took control of it and thought "oh, I'll send him a message, see where he is" and then they all went "oh, I've just sent him a message as well" so they were all kind of taking control, saying "where's the last member of our group?". There

wasn't one person who was leading that. You do not need a leader unless, I mean like we're having to hand in a project. So in the on-line situation I don't think anyone has become a leader but I think when it actually comes to handing in the project which we've all said we're going to do face-to-face because it's easier to get, to gather everything together, check it over, you know, hand it in, yeah then one person will become a leader. So, if you have something important to hand in then you need a leader, to organise everything". (Interview 41, 363:378)

### 8.3 LEADERSHIP OFFER

When the code *Leadership Offer* first created, quotations referring to willingness of certain group members to undertake or not the leadership role in the group were included. The creation this new code was based on constant repetition of certain interviewees commenting that they offered themselves to take up the leader's role. The next step in our analysis was the identification of the reasons why group members felt like acting in such a manner. A number of reasons were identified as presented in the next Figure 8.2.

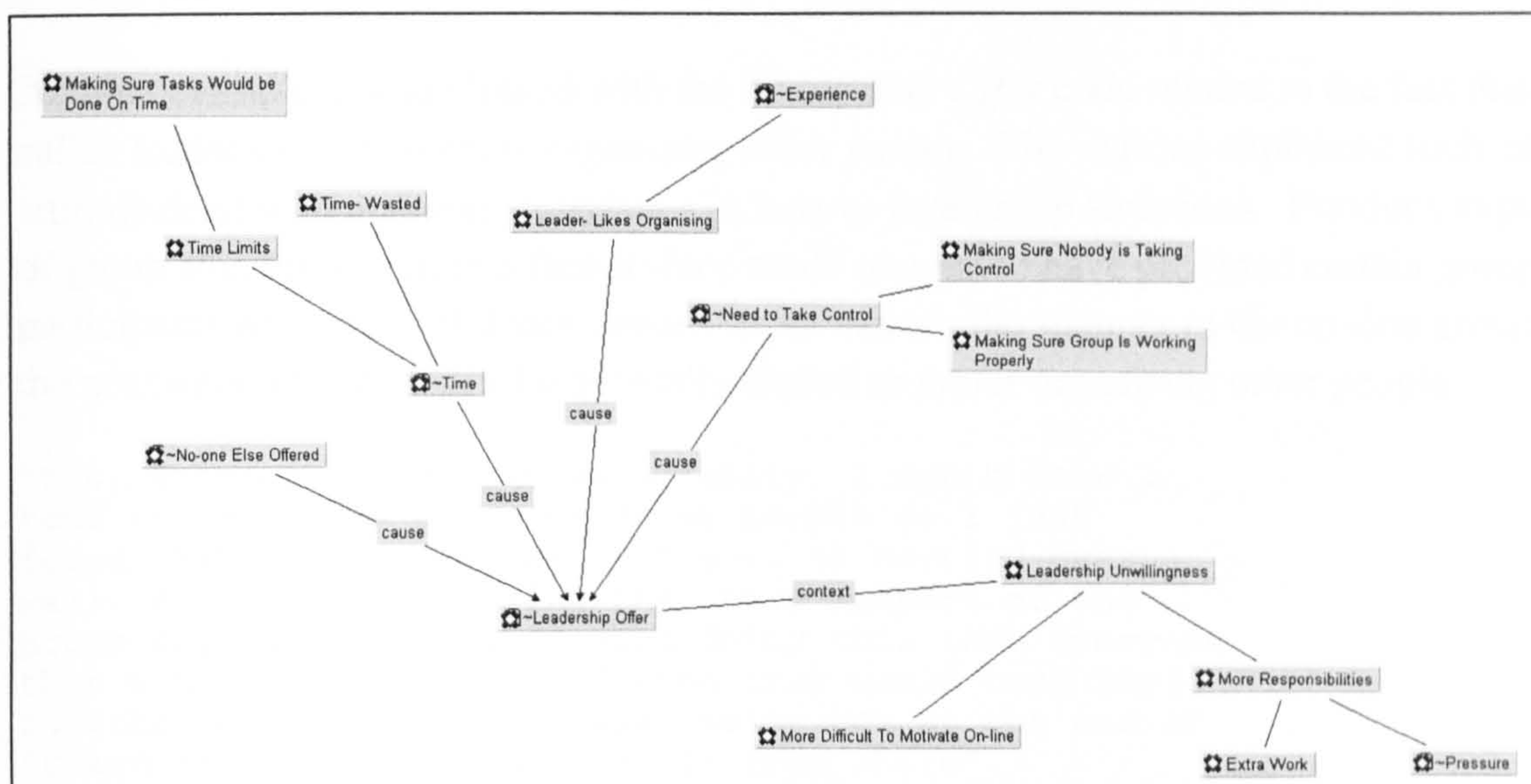


Figure 8.2- Leadership Offer

Initially, interviewees reported a *personal need to maintain control* over the group. They reported feeling an internal need, almost being obliged to know what was going on in the group, and if the group functioned properly.

"It just kind of whoever possibly you know feels a need to get the project moving, then feels obliged to take control or to give it a push". (Interview 48, 222:224)

"I think in our group I kept ... well, I don't know, I

wouldn't have really have said that I was the leader but I kept making sure that we was doing something like it'd be like "so what do you think to this?" or "I need a reply because we have to do it". (Interview 44, 280:286)

Additionally, the presence of the leader assured that *no one else in the on-line group would take control* attempting to express dominance. Thus, the control over the group was not an act *per se* aimed to the expression of authority from the leader's side. It was rather an action taken to prevent other group members' interventions and expression of authority. In other words, it was a way of maintaining balance in the group.

"You are probably looking at me, that happened because I was quite interested in doing the work before, and generally, I don't know why but whenever we had group work, I guess I just enjoy trying to know what's going on throughout the group and trying to get everybody's ideas together. If it's not really - I'm quite happy for someone else to take over if they want to, as long as the work gets done and as long as everyone has a fair say on it. So I'm quite keen to make sure everyone has their input and things. I guess in that sense I'm quite dominant to make sure that nobody's too dominant if you see what I mean". (Interview 25, 144:151)

Another causal condition linked with the *Leadership Offer* code related to the fact that the so-called leader seemed to *enjoy organising other people*. The reasons explained such an attitude dealt with *previous experience* in face-to-face group situations. Previous experience of group situations even in a face-to-face mode seemed to have provided certain group participants with the confidence needed to act in a similar manner in the on-line group. As the next interviewee reports he generally tended to prefer organising other people.

"Yes, I thought that was me actually. I don't know I tend to naturally organise other people so I just found that in this situation I sort of carried over as well. So, I was organising the other members of the group saying if you don't mind doing this then everyone they would do their bit and then they would come back together and we would see what we've got at the end of it and then just sort of send it from there". (Interview 10, 155:159)

Another interviewee reported, as an explanation, the need "to cover his own back", assuring that group members contributed their best. Again, the impulse to take up leadership could be linked with previous experience traced back in the school years.

"I am quite comfortable with the computer situation better than everyone I know, I feel fairly comfortable, but also part of me if I am organising something then I know it gets done so it is a need for me to cover my own back if I don't know how the other people work. I don't know it is something I used to do since I've been to school, organise other people". (Interview 10, 180:184)

As part of organising group members, and wishing to set group objectives, was also reported the *prevention of wasted time*. The leader offered to perform such a task because he/she did not want to waste any valuable time in the group.

"I have done that in group work I am quite sure why but the truth is that I don't like to waste time and it is very easy with group meetings a lot of time to be wasted. I like to sort of set objectives for everybody to do and set deadlines and say we will meet again next time and such and such".  
(Interview 18, 178:180)

Furthermore, pre-set time limits was another reason identified by the interviewees explaining why a certain person felt taking upon group control and making sure that tasks would be performed on time.

"Is it to make sure that everyone is going to work properly? Yes, you can't help feel that. I guess if you put yourself in the position - I could quite happily have put myself in the position where I didn't want to be the leader - I didn't do that. If it came fine, I don't mind doing it, that's fun, I don't mind doing it. If someone else want a go I'm quite happy for them to do it. I wouldn't hide myself away, so basically it was more and thing that I knew something had to be done by a certain time and you had to involve everybody, and if that responsibility fell to myself or Carlos or Gratsi, then OK that's fine. If no one else did it then I'd quite happily put myself in that position, I think we need some co-ordinator".  
(Interview 25, 186:208)

Finally, another condition identified simply related to the fact that *no other group member offered* to take upon such role. The group members who eventually offered to take up leadership admitted feeling in a way obliged to act in such a manner.

"And it just happened in the groups I was in that nobody seemed to want to take the lead or nobody suggested anything, they tended to sort sit there and wandering what to do next. So I did take the lead, I am not sure I know why but it seemed to have happened that way".  
(Interview 18, 181:184)

"I guess if you put yourself in the position - I could quite happily have put myself in the position where I didn't want to be the leader - I didn't do that. If it came fine, I don't mind doing it, that's fun, I don't mind doing it. If someone else want a go I'm quite happy for them to do it. I wouldn't hide myself away, so basically it was more and thing that I knew something had to be done by a certain time and you had to involve everybody, and if that responsibility fell to myself or Carlos or Gratsi, then OK that's fine. If no one else did it then I'd quite happily put myself in that position, I think we need some co-ordinator".  
(Interview 25, 196:208)

"I wouldn't have said they were overpowering or I'm the leader I'm going to do this. But if no-one else was sort of offering, then they're just probably the sort of person that says "oh well I don't mind doing it, I'll get it out the way". (Interview 41, 295:299)

### 8.3.1 LEADERSHIP NON OFFER

Apart from the cases where interviewees reported offering themselves to take upon the leadership role, a few cases were also identified where group participants declined to take control of the group organisation. They based such an attitude on a number of reasons. As stated by the next interviewee he did not wish to take up leadership explaining that something like that would mean *extra work* and effort.

"Did you offer yourself to be the leader?

He said he would do it - I said I'd do it the next time. I wouldn't mind doing it, but I wouldn't be bothered to do it, it is just extra work isn't it?" (Interview 37, 278:281)

Taking up such a role would not only mean extra pressure but also risk taking, being the negotiator, and facing group members' dependency.

"Would you like to be the leader if you had the chance?

No, it is so complicated because he had to be the negotiator between the different members of the group, he got pressure from everyone. Everyone is depending on you and this is extremely difficult". (Interview 26, 277:281)

As perceived by the interviewees, part of the leader's duties was to instil *motivation* in group participants' to perform their tasks. As presented in the next quotation such a task was performed with *difficulty on-line*, whereas it was perceived to be easier face-to-face. That is why the next interviewee refused to take up the leadership role, although he had done this many times in the past in face-to-face situations.

"Did you offer yourself to be the leader?

No because that person volunteered and in other group environments face-to-face I've tended to take a lead role and I was quite happy to sit back and let someone else do it for a change. You can't, you can't co-ordinate and lead all the time. No you can't really, you can't. It's often good to let other people, if someone else volunteers to do something.

Why did you feel that you had to do that face-to-face and not on-line?

It's motivation is, I find it easy to motivate people face-to-face than in an on-line environment".

(Interview 36, 461:471)

## 8.4 LEADER EMERGENCE

One of the questions that was asked during the interviews dealt with the emergence of the on-line leader in the group. Data showed that the leader's emergence was not planned, in other words, the leader was not officially "elected" by the group members, he/she would come up naturally in the group through a procedure of realisation for his/her necessity.

It was observed that the emergence of the leader, as it was presented in previous sections, was mainly based on:

- 1) group's realisation of the leadership need (*Leadership Need*)
- 2) personal (leader's) realisation of leadership need (*Leadership Offer*).

In the first case, the group realised that there was a demand for someone to take up several tasks in the group. The reasons leading to this realisation have already been explained in the relevant section (*Leadership Need*). Additionally, another factor influencing the emergence of the leader dealt with certain person's offering to handle the on-line situation and take up the leader's role. Once again the reasons why a person would chose to offer himself/herself to perform such a task had been explained in the relevant section (*Leadership Offer*).

However, the leader would also emerge naturally in the group. There was no official procedure leading to the leader's emergence. It could be supported that it happened almost by accident. The leader's emergence is linked to a number of conditions that had to be met to become evident that a certain person could assume leadership roles. During the course of the analysis it became evident that the person with the most contribution in the group was more likely to become the leader, or emerge as a leader. The leader arises naturally from the group, as the one who is participating, *contributing the most* in the group.

"I mean none of this was said, but I felt that three of us were participating more, I actually interacted with one person the most, I felt that he was contributing the most I think and he was probably the leader as well".

(Interview 11, 244:247)

"As I said the leader was the one who knows more and I think the he was then one participated the most. What we used to do was, the we would always come to the on-line meeting and we would just learn from him". (Interview 26, 123:126)

It is of interest what was supported by the following interviewee. Contribution in the group is maybe the only way to ascribe a leader.

"I mean the only way you can really ascribe a leader in the on-line situation possibly is by the fact that somebody maybe inputs more and makes things to be done, asks for more things to be done, or decides on a few more things or whatever. It is very difficult to judge of somebody's performance what to put in".

(Interview 28, 358:361)



Another parameter affecting the leader's emergence was his/her *Familiarity with the Subject*. The group participant who emerged as a leader had to have a fair level of understanding and familiarisation with the topic under investigation.

"I think that is the person who participates the most, the one who is organising things, the leader usually sends and e-mail to the us asking to meet up. On the other hand, the leader tends to understand the subject we are dealing with the most". (Interview 40, 248:252)

A leader will emerge from the group as being more enthusiastic about the group's work and he or she will give *new refreshing ideas* to the group. The supply of new ideas is considered to be quite an important factor, especially in the cases where the group is facing problems, therefore, there is an immediate need for someone to interfere putting group members' ideas together.

"My best friend is kind of interested in the same things as I am so when I have an assignments I bounce ideas off him and he'll do the same to me. So there's no leader - it's like a think tank but there's no real leader there. We're just quite structured in our thoughts and bounce things off each other and generally that's fine, but whenever there's maybe more than 2 people at the same time, I think - I don't think it's asserting a dominance I think it's just naturally someone will come up as being a little bit more enthusiastic or something about it, and people maybe look to that person to get the ideas together. I turned out that out of the group in England kind of led the way, I think that was due to part time nature of some students abroad and the kind of projects that they've had some problems while using the Web Board, so we felt that we had to push on a little bit while these problems were being sorted out. They weren't insulted by this at all - they came back to us and said, thanks we appreciate that you've done a bit of work, here's our stuff now". (Interview 25, 128:140)

The leader had also to give signs of *responsibility* in order to gain group's trust.

"Well you don't know - this is group work isn't it. It's discussion, it's compromise, I guess at the end of the day if you're the leader and you're stuck and everyone's got their own ideas and no one's willing to budge, then this may be the responsibility of person to say, well I think we should go this way. If it goes wrong then it's the leader's fault, right. Take responsibility". (Interview 25, 180:184)

So, it happens that group members who are more responsible are going to be the ones who will emerge as the leaders.

"There is a person who always send the final e-mails to the course leaders, I think that this has to do with the sense of responsibility someone has, some people who are more responsible than others they feel that if no-one seems to care then they have to do the work. Then this person will naturally emerge as a leader". (Interview 40, 179:184)

The leader would also have to have good *communication skills*, being able to interact with different types of people

"The person becomes the leader because he is dominant, and he is actually free over the communication thing. It has to do with the personality as well because if you like socialising, you can socialise face-to-face and you can socialise on-line and if he likes to interact with people then he can type away and make the image of the leader".  
(Interview 03, 202:206)

"First of all this person should be able to communicate with different types of people, and he will also know much more about the topic, the area under investigation, and maybe he is really interested on the topic, that is quite basic". (Interview 26, 187:190)

Additionally, the leader would be the group member who could give signs of *being organised*. By being organised and taking initiatives the leader could gain the group members' trust.

"Well, I looked at his guy because I found that he was the most organised one and he is the one that gets everyone together, I support him before I think he is doing good to the group. I also think about the other two girls I think they are pretty equal, but there isn't any designated leader. I see this guy as an organised, co-ordinator for getting things together. I mean I could take that role but I just feel like doing a supporting role". (Interview 11, 314:318)

"I don't really know if it makes so much difference, I suppose it is quite important the leader to be organised as a person, willing to take a chance, stick their neck out and take a lead. Or maybe the person is got to be quite motivated in order to get the work done, otherwise they are not going to bother". (Interview 27, 174:188)

## 8.5 LEADERSHIP: INTERVENING CONDITIONS

### 8.5.1 FAMILIARITY WITH COMPUTERS

As discussed previously in the *Participation* category chapter, one of the codes found in connection and placed within the intervening conditions was someone's familiarity with computers. The code was also found to link to the *Leadership* category. A large number of interviewees commented on effect of someone's familiarity with computers in leader's emergence. Interviewees stressed the importance of someone's *familiarity with computers* in becoming a leader. The leader is not supposed to be a "genius" with computers, however, a

fair level of familiarity is needed for the leader to make him feel comfortable and confident enough to perform his/her tasks and duties.

"I am quite comfortable with the computer situation better than everyone I know, I feel fairly comfortable, but also part of me if I am organising something then I know it gets done so it is a need for me to cover my own back if I don't know how the other people work. I don't know it is something I used to do since I've been to school, organise other people". (Interview 10, 180:184)

"I don't think that familiarity with the software would make people participate more or take the lead. I think it is more familiarity with the hardware because if you are familiar with one word processing package then you feel fairly confident using other things and you can adapt in using new packages that you never used before. Then, there will be lots of similarities and you won't feel so scared, but if you haven't used a computer before you will be scared of pushing buttons in case you break it. This is way I don't try to teach my parents how to use a computer. *So, is familiarity with computers in general making any difference?* Yes, because you feel more comfortable". (Interview 21, 371:381)

The next interviewee perceives familiarity with computers as vital, so its lack could be "fatal" for the group. It of interest to see how in the next quotation the interviewee puts together familiarity with computer along with the knowledge of the aims and objectives of the group tasks. The lack of combination of these two characteristics can be really damaging for the group, like asking a "blind man to drive a car".

"The leader would have to feel comfortable with the whole computer situation, on the other hand he or she should have a knowledge of what the group is trying to achieve otherwise if he or she doesn't know what the aims and the objectives are is like you are getting a blind me to drive a car and he or she will drive to death the members of the group". (Interview 24, 203:212)

Consequently, acquiring a fair level of knowledge about computers helped the leader to gain the confidence needed in order to be able to manage the group.

"It would probably... if it is going to be the sort of person who would offer then they probably would have good knowledge of computers because to have the confidence in themselves to say "I'll ... I'll ... I'll organise this". Then they probably would have good knowledge of computers. Not necessarily but probably". (Interview 41, 326:331)

As presented in the next few quotations, the leader used familiarity with computers with the aim of making an impression to the group members. The impression made by the person "commercialising" his/her skills was probably the key factor to make the group members decide who was going to be the leader. It is of interest to see in the next quotations how group members presume that the leader knows more than the rest of the group, just because

he or she knows a lot about computers. In other words, the use of computer skills is a way of exercising authority in the on-line group.

"In my case from the on-line group we formed our group leader was a genius in the computers. Familiarity with computers should be one of the key factors that make somebody a leader in an on-line situation. In our group everyone knew that he is very good in computers, so we just presumed that he knew more than the rest of the people. I think that one part is know about computers and the other part is to know where to find the relevant information.

*How did you find out that this person was very good in computers?*

That happened because every time I had a problem with the computer he always knew what to do".

(Interview 26, 211:224)

"I think that familiarity with computers is a very important factor that would make someone the on-line leader, because when someone seems to know a lot about computers that gives to the other members of the group an impression".

(Interview 29, 211:215)

In other cases interviewees did not perceive computer literacy as an important factor. However, as the necessity for the leader's familiarity with the computers could emerge although not originally envisaged.

"Well, I don't know, because for our group that wasn't really a factor for choosing the leader, it turned out that it was eventually. However, at the beginning it wasn't a factor at all, because I think you can still perform the duties of a leader without having the technical background, I don't think that the technicalities adding a problem if someone can do it, they might as well do it and there is no need for a technical background. There is a stereotype taking people really into that, but I don't really think that is necessary. So, we didn't set the leader to this and that but it actually happened through the reality".

(Interview 23, 169:178)

## **8.5.2 FAMILIARITY WITH THE SOFTWARE**

Additionally, familiarity with the software was considered by the interviewees to be a factor playing an important role in the leadership group category. It was placed with the intervening conditions used to facilitate the on-line interaction. However, familiarity with the software was not considered to be such an important factor as familiarity with computers and hardware. The reasons and explanations given by the interviewees dealt with the "friendliness" of newly developed software. The different types of software that facilitate on-line group are relatively easy to learn.

"I think that the familiarity with the software makes a difference as well but it is not as essential as knowing

about computers in general. Most of the software that are available are quite easy to learn, so if you have a general knowledge about computers you can easy teach them". (Interview 26, 228:231)

"Familiarity with the software doesn't play an important role after all, the existing software is very easy to use, you do not need programming skills, everything is very user friendly nowadays, the only thing you have to know is to press button and write words". (Interview 29, 220:224)

Familiarity with the software makes a difference in the acquisition of leadership in the group, but it is not perceived as important as computer literacy.

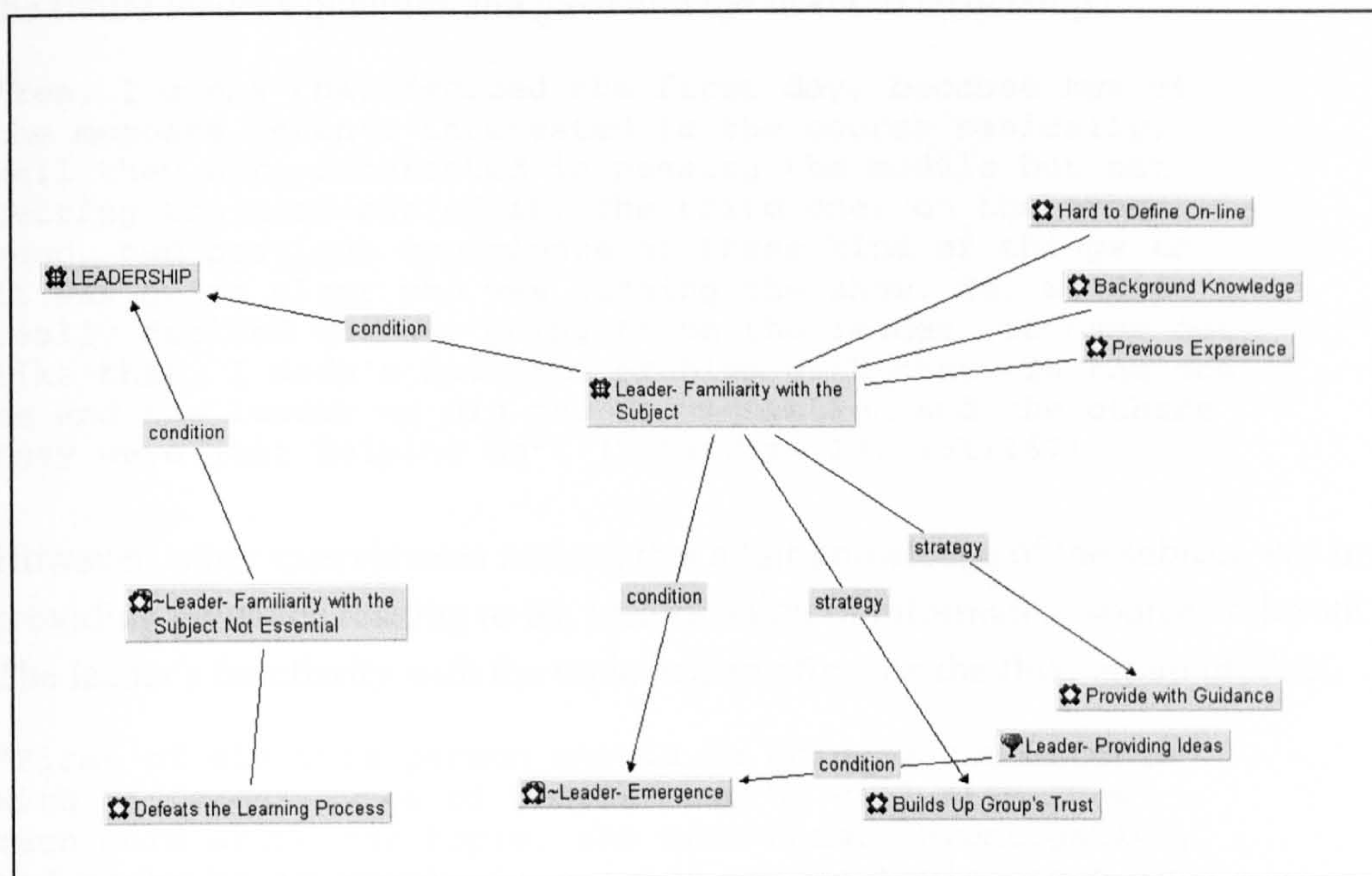
"Yes, I think that the familiarity with the software makes a difference as well but it is not as essential as knowing about computers in general. The most of the software that are available are quite easy to learn, so if you have a general knowledge about computers you can easy learn them". (Interview 26, 228:231)

However, even if familiarity with the software was not considered to be such an important factor, knowing how to use the software could be considered quite an advantage for being the leader. In the next quotation software literacy plays a role under the condition that nobody else in the group knows how to use the specific software the group members use for communication.

"Yes, it does because if nobody else does, people are going to refer to the person who has got more experience in computers or in the software. Yes, initially at least in terms of how to use it although they may not become dominant if somebody else has more ideas in terms of what you are going to do with it rather than how you use it, how you use the software itself". (Interview 28, 179:183)

### **8.5.3 FAMILIARITY WITH THE SUBJECT**

*Familiarity with Subject* is another intervening condition facilitating the leaders' performance of duties in the group. The person that is going to emerge as a leader from the on-line group will have to have a fair level of understanding and familiarisation with the subject under investigation, with the group project's topic, as shown next in the Figure 8.3.



*Figure 8.3- Leader's Familiarity with the Subject*

"How did you choose who was going to be the leader?  
I think that is the person who participates the most, the one who is organising things, the leader usually sends and e-mail to the us asking to meet up. On the other hand, the leader tends to understand the subject we are dealing with the most". (Interview 40, 248:252)

The comment made by the next interviewee is interesting, where the level of a certain group members' knowledge of the topic is put under question. The interviewee comments that it is quite difficult to define someone's knowledge on a specific topic, especially when on-line.

"Of course because you know what you are talking about, you are more confident. I think the leader should be the person who really knows more about it but how do you know how much they know, because some people think they know more than others. It's difficult to find a leader really, it comes with personal qualities in general I think what a leader is someone that can actually, not the one who knows more, because you never really know who knows more, is somebody that has qualities, should be more confident I think, more stronger, more extrovert that's what I'm saying extrovert personality".  
(Interview 38, 293:300)

Interviewees reported that a satisfactory level in the leader's familiarity with the subject was expected. This built up group members' trust, a parameter needed if someone wanted to take up leadership tasks in the group. How important such a factor is for the emergence of the leader, is illustrated quite successfully in the following quotation, where the interviewee

points out that the previous experience of one group member was used as measure to define the future leader's qualities and gave him the ticket to leadership.

"Yes, I guess that decided the first day, because two of the members weren't interested in the course basically, well they were interested in passing the module but not getting the most out of it. The third one, on the other hand, had previous experience of these kind of things so it was quite clear who was running the show. So, we didn't really decided who was going to be the leader, it came out like that, I didn't have the problem with that. In the end me and the leader we did the documentation and the others they were just helping us". (Interview 19, 161:167)

However, other interviewees noticed that a fair knowledge of the subject was important for providing guidance relating to the identification of information sources relevant to the topic. The leader's familiarity with the topic had an effect on the final group product.

"First of all this person should be able to communicate with different types of people, and he will also know much more about the topic, the area under investigation, and maybe he is really interested on the topic, that is quite basic. Our leader he knew how to use the search engines, he knew where to find the information in the web, how to link and how to download these kind of things. The rest of us we didn't even know how we were suppose to look for relevant information, we only knew "yahoo" but he knew where we were suppose to go to find the information that we needed". (Interview 26, 185:193)

The background knowledge and the quality of input and information supplied to the group are considered to be very important factors influencing the group's decision to give the co-ordinator's role to a specific person. The explanation given by the next interviewee sounds convincing. The person who is holding the greatest level of familiarity with the subject, who has prior knowledge or experience on the topic, is going to be able to give new and refreshing ideas to the other group members.

*"How do you choose who's going to be the leader?"*  
In the on-line environment I think the only way you could, not the only way but one of the ways you could do it, was to actually if someone's giving you a lot of quality information, you could choose that person. Like if it was me and I was doing an on-line discussion with 6 or 7 people, and one person wasn't participating a lot and the stuff they were actually sending wasn't really quality, I would not want to give them the co-ordinator role because they don't seem to have a lot of background knowledge about the subject. If you're looking at a subject, they may not have to have a lot of information or a lot of knowledge about it but if they've got the knowledge, kind of base of knowledge they've got is good and sound and they've got good ideas and they appear to be interested let them co-ordinate then. The knowledge of the subject is relevant if you're looking for a co-ordinator in an on-line environment because you can't pick someone that doesn't seem to have a grasp of the subject because if you were giving them your work

to co-ordinate and assess you don't want to do that, in my eyes". (Interview 36, 484:502)

However, among the quotations found and coded under the code *Familiarity with the Subject* a number of other quotations were found pointing out that the leader's knowledge of the subject is not as important as some people might think. Interviewees, supporting the above argument, based their explanations on a number of reasons. Prior knowledge was not found to be necessary as it was thought to defeat the learning process. Interviewees admitted coming to the university in order to learn and experiment. Prior knowledge of some members could spoil such experimental learning.

"Do you think that familiarity with the subject makes a difference as well?

Yes, it probably does although it is suppose to be a group learning exercise, so to some extent you will become familiar with it or pick it up". (Interview 28, 185:188)

"If he's co-ordinating he's got all the other people's views anyway. He doesn't necessarily have to be that familiar with the subject, as long as he understand it afterwards. I would have thought it would have helped if he was familiar with it, to begin with". (Interview 37, 300:305)

On the other hand, familiarity with the subject is not always considered an important factor because group participants holding a great level of knowledge of the topic are more likely to dominate in the group, as they would probably try to force the rest to follow a certain route. Other qualities are obviously considered to be more important for the leader. Even if the leader is lacking in familiarity with the subject the rest of the group can always cover this "weakness" and make up for the leader. This is after all the reason why a group exists, so group members will be able to "cover up" each other's "weaknesses".

"Not necessary because if it seemed that the other person was most familiar with the subject then again it'd be like they're pushing everybody else into it because they know and they know what's best but I think as long as they can communicate properly with the other people and so sort of get their knowledge and understand what they're saying about the subject, it doesn't really matter if they know about it or not because the rest of the group can help them". (Interview 44, 358:365)

#### **8.5.4 TYPING SKILLS**

*Typing Skills* has been used in the *Participation* category as an intervening condition, as found to facilitate the on-line group participation. *Typing Skills* code was also found to relate to tested the *Leadership* category. Typing skills was considered to be a way of expressing dominance in the group. Group participants who were able to type fast were able to convince the rest of the group members that they were capable of managing and leading the group.



Participants, who were able to type fast, and confident with the computer situation would probably be the ones who became the leaders.

"The person that could type well probably will be the dominant one, because some people finding it hard to type, you know they are not used to keyboard or they are scared of the packages and you get some nervous people thinking if I do this I will crash this and they are not very computer literate, whereas the ones who are computer literate they are the ones who seem to be able to manage the group. The ones who have used the computers for several years are the ones who are more confident". (Interview 03, 225:231)

In an opposite way, group members unable to type fast gave the impression of not being able to manage the group and become the leaders.

"Yeah to the same extent that you'd have to be with computers, good with the technology. I suppose, if someone felt perfectly confident and perfectly comfortable typing, if they felt uncomfortable and unconfident doing it then no they wouldn't be the leader". (Interview 41, 346:350)

On the other hand, typing skills assisted in the creation of the leader's image.

"The person becomes the leader because he is dominant, and he is actually free over the communication thing. It has to do with the personality as well because if you like socialising, you can socialise face-to-face and you can socialise on-line and if he likes to interact with people then he can type away and make the image of the leader". (Interview 03, 202:206)

Fast typing skills could help the leader to intervene, when needed, during the synchronous on-line discussion, preventing other group members to intervene and deprive their peers of participating. The leader's task at cases like this was to take a sit back and intervene whenever s/he thought was necessary, assuring a smooth group interaction.

"Yeah, yeah I do think so yes definitely, in order to prevent that no-one else can jump in, the leader will organise everything, therefore they what they are saying has to be said on time before somebody else bumps in. I think a leader can just sit back and watch what's happening and then interfere and then on-line there is no control is there? If you don't have a leader constantly coming into it oh, you can't say that it's very difficult on line now with a leader because you can't really you can't see him". (Interview 38, 283:290)

### **8.5.5 WRITING SKILLS**

The code *Writing Skills* referred to the effective use of the written form of communication. During the on-line group interaction, the leader and all the other group members needed to communicate verbally with their peers. Therefore, the interviewees identified a need for the

development of writing skills. The code *Writing Skills* was found to be linked with the code of *Sense-making*.

"What sort of qualities you think the leader should have? To be punctual to get it in on time, to be able to organise it quite well, is quite good at English and stuff like that, to write something that made sense quite quickly. You have to pay attention to the discussion quite a bit".  
(Interview 37, 283:287)

Writing Skills were considered to be even more important than typing skills.

"This person should have good verbal communication but also he or she will have to be able to type quite well to make sense, otherwise it would be pointless really. Not really typing skills, just making sure that it made sense afterwards. I didn't matter how long it took him to type is really".  
(Interview 37, 289:294)

"What we usually used to do was that first we would look at the task, trying to figure out what exactly the task would require, then you would discuss it, find the information that we needed. The there was a person who would take the obligation to compile the discussion, this person would change a few things, pull out the irrelevant bits, present the whole thing in a nicer way that it would make sense and then this person would sent the final thing". (Interview 14, 116:120)

## **8.6 LEADERSHIP: ACTION/ INTERACTION STRATEGIES: LEADER'S DUTIES**

After the leader emerged in the on-line group, he/she had to perform a number of duties/responsibilities during both synchronous and asynchronous communication. All codes found and placed under the leader's duties and responsibilities category are considered to be action/interaction strategies, as they indicate the ways the phenomenon of leadership has been managed and carried out in the on-line group situation.

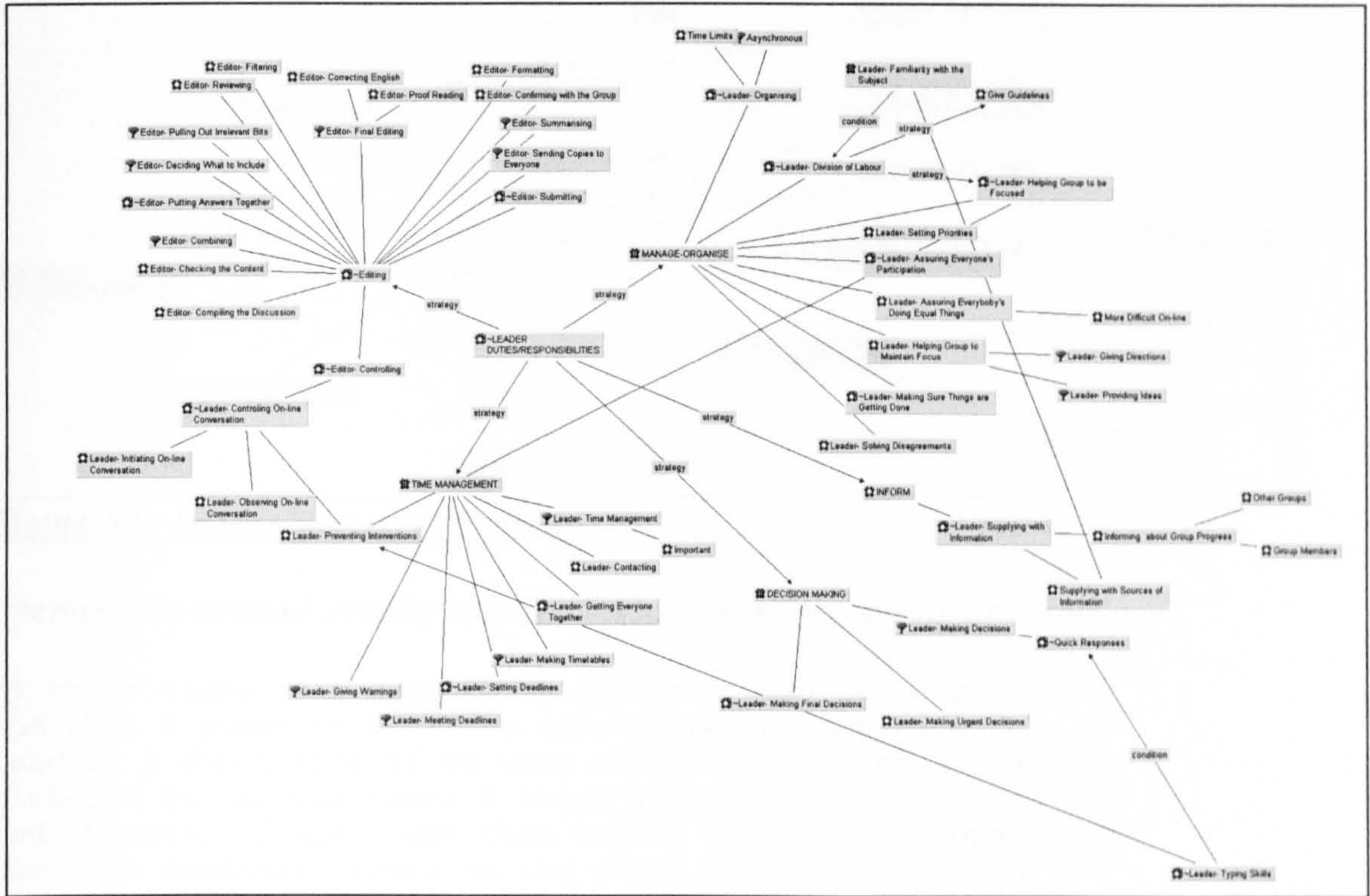


Figure 8.4- Leader's Duties

Leader's tasks and responsibilities during the on-line group interaction were divided into five main categories namely: *Manage-Organise*, *Inform*, *Make Decisions*, *Time Management* and *Edit* are presented in the above Figure 8.4.

### 8.6.1 MANAGE-ORGANISE

Initially, the leader had to manage and organise the group performing a number of duties as presented in the next Figure 8.5.

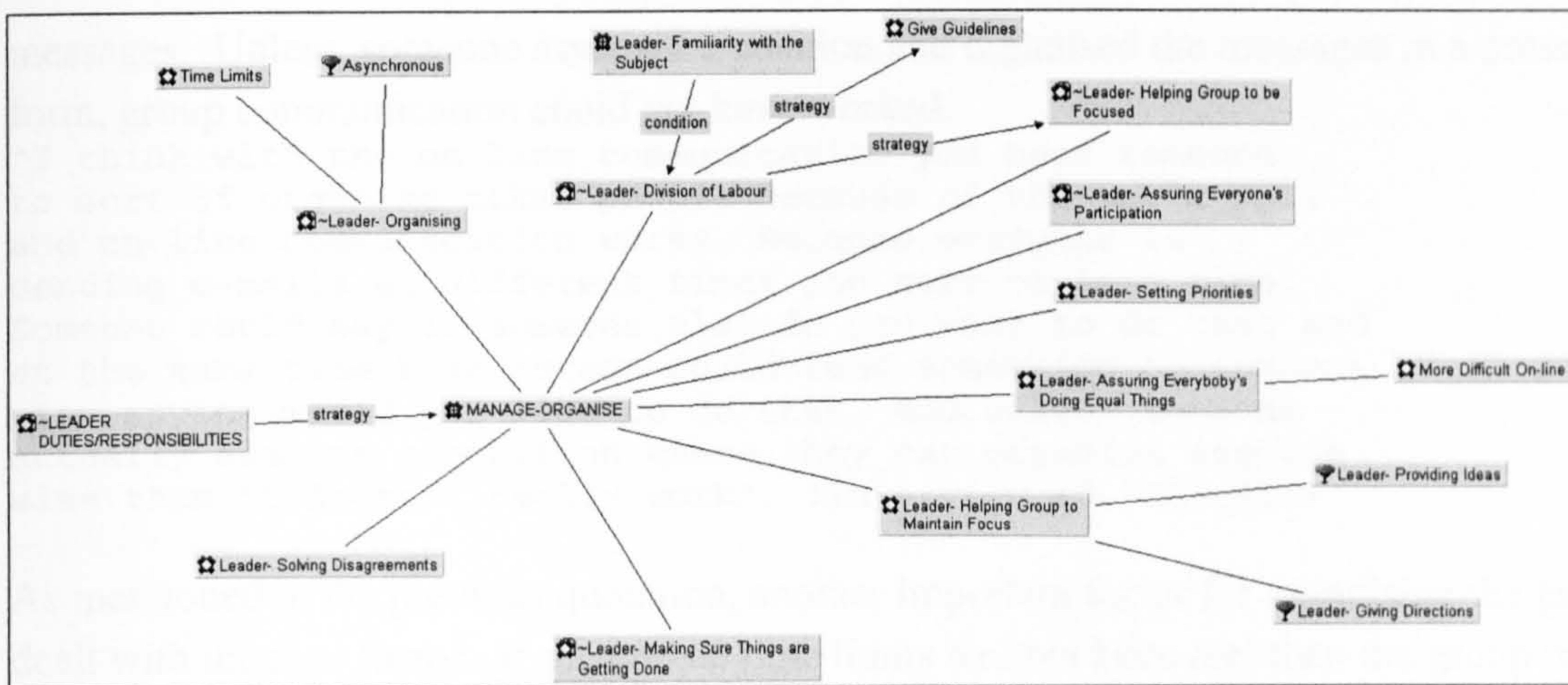


Figure 8.5- Leader Manage- Organise

Interviewees stressed initially the *need* for having an *organising principle*.

"I think there is a need to be an organising principle, and this I guess it could be interpreted as having a leader. I don't know if we were suppose to having a leader, although in various times I think people felt like being led. However, I would use that strong word, it is more like having a dominant person in the group who would come up with an initial suggestion for a topic and persuade the members of the group to use it". (Interview 28, 144:148)

The person who took up the duty of organising the group had to organise 1) the other members of the group and 2) the project. In the following two quotations the so-called leader in the on-line group had a tendency to organise other people, a quality inherited from their school days.

"I don't know I tend to naturally organise other people so I just found that in this situation I sort of carried over as well. So, I was organising the other members of the group saying if you don't mind doing this then everyone they would do their bit and then they would come back together and we would see what we've got at the end of it and then just sort of send it from there". (Interview 10, 155:159)

"I feel fairly comfortable, but also part of me if I am organising something then I know it gets done so it is a need for me to cover my own back if I don't know how the other people work. I don't know it is something I used to do since I've been to school, organise other people". (Interview 10, 180:184)

The quotations found and coded around the code of *Leader- Organise* provided also the reasons why the leader felt that he/she had to organise the rest of the group. Firstly, it was felt that someone had to take up organisation in the on-line group because of the way on-line communication works and in particular its asynchronous mode. As group members sent e-mails and messages at different times, there was a vital need for organisation of the existing

messages. Unless, someone assumed a position and organised the messages in a presentable form, group communication could not have worked.

"I think with the on-line communication you need someone to sort of organise other people because of the way e-mail and on-line communication works. Because everyone is sending e-mails at different times you sort of lose time. Someone could say to someone else do you want to do that and at the same time that person could send something to someone else saying would you like to do that. And unless someone actually assumes a position where they can organise someone else then it doesn't really work". (Interview 10, 227:233)

As mentioned in the previous quotation, another important factor for organising the group dealt with the *time* factor. If the pre-set time limits had not been met then the group project would have failed.

"The leader in the group would organise and administrate the other members of the group when there are time limits, he or she should also minimise the limits of failure of the project". (Interview 29, 186:188)

The leader also took up *the labour of dividing* and splitting the *tasks* among the group members.

"What I found was when you meet a certain task I tended to say right you need to get this done we would try to split it up, we would say if everyone could do this bit there". (Interview 10, 145:147)

"Yes, I thought that was me actually. I don't know I tend to naturally organise other people so I just found that in this situation I sort of carried over as well. So, I was organising the other members of the group saying if. You don't mind doing this then everyone they would do their bit and then they would come back together and we would see what we've got at the end of it and then just sort of send it from there". (Interview 10, 152:159)

Background knowledge on the topic could be helpful as leader would be able provide group members with guidelines.

"Initially, because the leader knew well the topic area brought us all the different information on what to do, what sort of areas we could look at, and then we started picking up some of the part, and then we would discuss them. So, we ended up with some main headlines, some main directions of the things we wanted to do, and then we said OK there are six or five people in the group everyone would go alone to find some information about the different headlines. Then we would come back together and we would say I want this topic and I want the other one, so everyone picked up one specific topic and he or she would try to find more information on their topics". (Interview 26, 131:138)

In the following quotation it becomes clear how the leader attempted to split the tasks among the group members. The number one criterion was based on the personal preferences of the group members. The leader tried to identify group members' specialities or expertise (if any) or simply find out which areas certain group members felt more comfortable developing. Acting in such manner, the final group outcome could probably be improved. The reasoning is based on the fact that background knowledge provides directions, helping group members to become focused from the initial stages of the on-line interaction. However, such an attitude towards group learning could have its drawbacks, as it could eliminate the learning process, which includes learning by experimentation.

"With the group as it was I tried to sort of split things up, to make sure that people will do equal things. First of all I offered "is there anything you particularly want to do", I mean something that they might feel more comfortable doing it, or they happen to know more about than trying to do something in the dark with something they don't really know. So, people they came back and said I would like to do that and if it came to a point when three different people would like to do the same thing then I would have to say well look if the two of you can work together and the third person would look on what they've done and sees if there is anything you want to add to that, that's great but could you also look another thing as well. And people seemed to be OK with that so it seemed to work this way".  
(Interview 10, 189:198)

After dividing the tasks among the group members the leader had to *set priorities* on the group aims and on how the group members should work on them.

"I think the group needs somebody who would have ideas without actually forcing them on others. Basically, he or she has to set some priorities in terms of what the group is trying to achieve, take away the things that are irrelevant". (Interview 28, 157:160)

Another of the leader's responsibilities that is closely connected to the division of labour is dealing with the assurance that group members would *take on equal tasks*. In other words, the leader would try to make sure that there was no disproportion of labour among the on-line group.

"With the group as it was I tried to sort of split things up, to make sure that people will do equal things".  
(Interview 10, 189:190)

As noticed in the following quotation the leader's role of assuring everyone's equal contribution is more important on-line than in a face-to-face situation. In a face-to-face situation it is easier to observe group member's contributions. There is also an increased interpersonal pressure presentation of the group participants' work. However, in the on-line situation it is difficult to make group members disciplined, assuring equal amounts of work.

"They've got to be fairly well disciplined in themselves because they're taking responsibility for other people's work.

And in an on-line environment you can't easily tell whether the person's done what they've said they're going to do and stuff like that. In face-to-face it's very easy to see if someone's lying and saying "oh" you know "I've done this" and you can tell by the tone of the voice. Whereas in on-line the person's got to be a lot more self disciplined I would say. And it's the same in tele-working. You've got to be a lot more self disciplined. I think they would also chase people up. And obviously as the co-ordinator in my eyes that would be their role to co-ordinate and try and get everyone's information together. I don't think it'd be fair to say that person would make the ultimate decisions or lead the direction of the group or tell people off because that's not their role. I mean in the group we're in, kind of in the on-line group, we've all got equal parts". (Interview 36, 571:582)

Additionally, one of the other major leader's duties would be to keep the group working and *assuring* that everyone in the group would *participate* with their share of contribution.

"And we thought that he seems to have the sort of qualities that are needed to be a leader, and we just said you just keep some track and you can be the leader. I think at a time he didn't really wanted to be a leader but in a way he was already being himself, it seems that there was nothing else there but keeping the group in order, stopping any arguments and keeping the group working". (Interview 09, 219:224)

The comment made by the following interviewee is of interest. He mentions that he is trying to assure everyone's input in the group. As presented, he is taking up the leadership role, a dominant role by definition, in order to assure that no one else in the group is dominant.

"You are probably looking at me, that happened because I was quite interested in doing the work before, and generally, I don't know why but whenever we had group work, I guess I just enjoy trying to know what's going on throughout the group and trying to get everybody's ideas together. If it's not really - I'm quite happy for someone else to take over if they want to, as long as the work gets done and as long as everyone has a fair say on it. So I'm quite keen to make sure everyone has their input and things. I guess in that sense I'm quite dominant to make sure that nobody's too dominant if you see what I mean". (Interview 25, 144:151)

Furthermore, one of the leader's duties included helping group members to *keep on track* and remain focused. Maintaining the relevance to the project's focus was one of the most important tasks a leader had to perform. If the group became disorientated, then there was high chance that valuable time would be lost. As a result it would become increasingly difficult for the group to go back and remain focused.

"Well apart of getting people who like using the technology, using also a method. Additionally, there must be someone not to moderate really but help the group to be focused or keep on track, if there is like say a specific task to do, I mean he/she is not saying social interaction and joking is not allowed but basically he or

she is there to help the group, prevent the group to go of track to do something that is not relevant to the task, and then help them to get back to what the task is or just give a few ideas. Having someone like that, he or she is not quite the leader but somebody who is listening and giving some ideas to help the group along as well. I think the group would be motivated as well through that".  
(Interview 11, 530:536)

"And we thought that he seems to have the sort of qualities that are needed to be a leader, and we just said you just keep some track and you can be the leader. I think at a time he didn't really wanted to be a leader but in a way he was already being himself, it seems that there was nothing else there but keeping the group in order, stopping any arguments and keeping the group working, saying when and where we are going to meet next time and if the time is all right and where the work is going if it is going anywhere".  
(Interview 09, 219:225)

Moreover, it seems that finding the right person to be able to help the group remain focused becomes a necessity for the group.

"So, I didn't think that there was anyone who was particularly a leader in the face-to-face situation, I think it was more evident in the on-line situation that we needed Simon as leader. At the very start we didn't have a leader, and I think at the beginning we just thought the deadline, but as the deadline was only a month away it was when we knew that we had to get down to work seriously, then we thought we do need someone to keep the group on track, does anyone mind doing it, and someone sort of volunteered and after we had a discussion we seem to sort of agree that Simon would handle the whole thing quite well, and he would carry on doing what he did, and he seemed to be OK with that, an I think it helped very much the group both on-line and face-to-face".  
(Interview 09, 273:282)

"It was very difficult in our group because no-one was sort of very eager to be a leader, I you see what I mean, and basically we just said well I think we do really need to have a leader, or else the direction is going to turn completely from what we are doing, and there was a guy called Simon whom we decide to give him the leadership, because it was the person who usually said that is enough there lets go back to what we were doing, and we thought that he seems to have the sort of qualities that are needed to be a leader, and we just said you just keep some track and you can be the leader". (Interview 09, 215:221)

The leader performs the task of helping group members remaining focused by *giving directions* to the group members on how to proceed.

"Did you form some sort of a leader there?  
Yes, we did. It just made it a lot easier having somebody to say lets do that this time, lets do this, we had a focus we knew what we were doing, when we were doing it, so we



had targets because we actually had to face the deadline, so it is a lot easier to get the work done.

*So, what this person would do for the group?*

They just suggested we do a certain amount of work at a certain amount of time, like trying to meet the group deadlines, actually the course work deadline".

(Interview 23, 144:154)

"Well you don't know - this is group work isn't it. It's discussion, it's compromise, I guess at the end of the day if you're the leader and you're stuck and everyone's got their own ideas and no one's willing to budge, then this may be the responsibility of person to say, well I think we should go this way". (Interview 25, 180:184)

The leader helped group participants to remain focused by *supplying them with new refreshing ideas*.

"Having someone like that, he or she is not quite the leader but somebody who is listening and giving some ideas to help the group along as well. I think the group would be motivated as well through that". (Interview 11, 533:536)

"I think the group needs somebody who would have ideas without actually enforcing them on others. Basically, he or she has to set some priorities in terms of what the group is trying to achieve, take away the things that are irrelevant". (Interview 28, 157:160)

In the next quotation the interviewee talks about the way he exchanges ideas with one of his peers. The exchange of ideas in this case was between two people. However, when more than two group participants are involved there is a need for someone to come along with some new refreshing ideas with the purpose helping the group to proceed. As the next interviewee of remarks group members did not take offense by the leader's intervention. Rather the opposite, supply of new ideas resulted in this person's appreciation.

"Yes I think it's true - it really depends, because, my best friend is kind of interested in the same things as I am so when I have an assignments I bounce ideas off him and he'll do the same to me. So there's no leader - it's like a think tank but there's no real leader there. We're just quite structured in our thoughts and bounce things off each other and generally that's fine, but whenever there's maybe more than 2 people at the same time, I think - I don't think it's asserting a dominance I think it's just naturally someone will come up as being a little bit more enthusiastic or something about it, and people maybe look to that person to get the ideas together. I turned out that out of the group in England kind of led the way, I think that was due to part time nature of some students abroad and the kind of projects that they've had some problems while using the Web Board, so we felt that we had to push on a little bit while these problems were being sorted out. They weren't insulted by this at all - they came back to us and said, thanks we appreciate that you've done a bit of work, here's our stuff now". (Interview 25, 128:140)

Another of the leader's tasks is to *make sure* that all the *tasks* are *performed* the way they should be in the group.

"Well, I did wondering one thing with this other person, who would cut and paste the things together whether or not this person would try to get to the position of being the leader or not, but it could be interpreted in another way as well, of somebody who is kind of concerned about the outcome of the project and therefore who wants to make sure is going all right. I know from another group, which wasn't an on-line interactive thing that he is concerned of getting things done, and getting things done well, and it was a bit of a control freak, so you know people sometimes are like that, it is not necessary that they want to be a leader, maybe they are just more concerned about how they do". (Interview 28, 279:286)

## 8.6.2 INFORMING

The leader also had the responsibility of supplying group members with information relevant to the group's tasks and needs. In other words, the leader would take up the role of the information supplier in the group. The role of the *information supplier* in the on-line group is twofold. Firstly, the leader would have to make sure that he/she keeps the group members informed on what is happening inside the group and on the process of the group project. Additionally, he/she had to inform group members on the progress of the other groups.

"Mostly, I think he or she should be the co-ordinator, and the communicator, you need someone to inform the group about all the things that have been done, about the progress of the entire project". (Interview 24, 186:190)

"Yes, we did have a leader for the face-to-face interaction. It was actually a female, her main responsibility was to organise us, asking us what we wanted to do, what part of the project. She would also try to keep us informed of what was going on in the other groups, and inform the other that we were doing this and that". (Interview 14, 138:141)

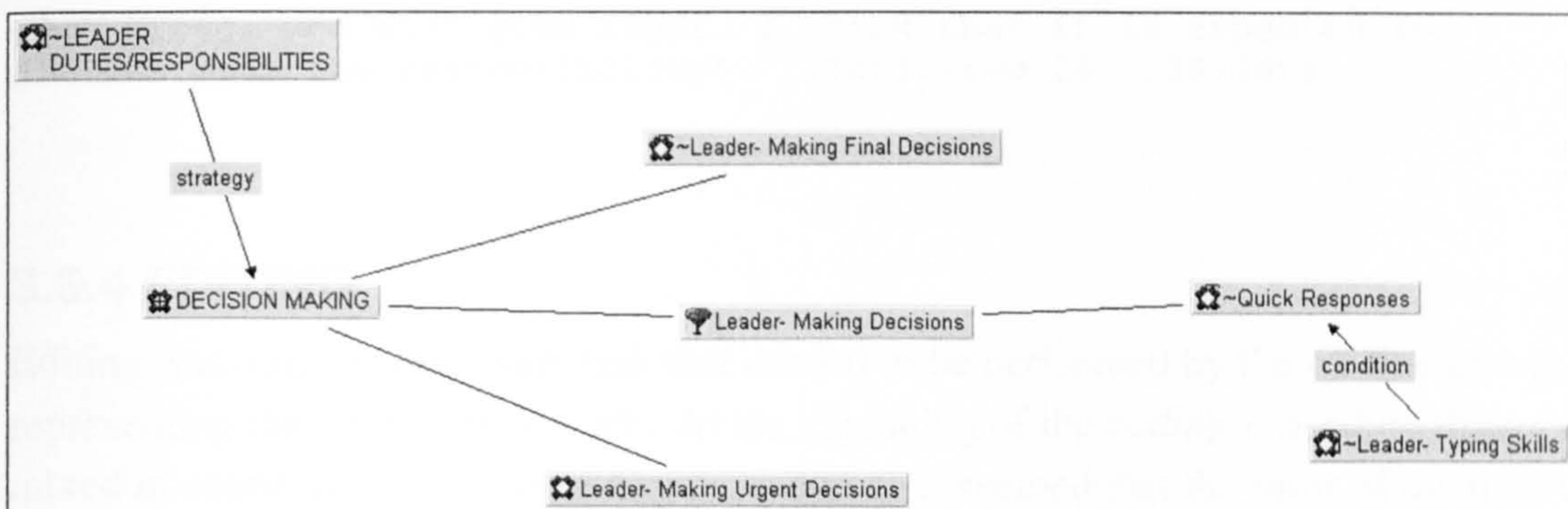
Additionally, interviewees commented that the leader should be the one who would bring the sources of information to the group members. As it has been said before one of the leader's important qualities would be his/her familiarity with the subject under investigation in the group project. Therefore, if the leader holds a great level of familiarity with the topic, then he/she will know where to look for the relevant information and in a way show the way of finding information to the rest of the group.

"After we would bring back the sources of the information, he would look at them and he would go, oh now you show this you can also have a look at that. So, actually it was him who would bring lots of information to the group". (Interview 26, 147:150)

"First of all this person should be able to communicate with different types of people, and he will also know much more about the topic, the area under investigation, and maybe he is really interested on the topic, that is quite basic. Our leader he knew how to use the search engines, he knew where to find the information in the web, how to link and how to download these kind of things. The rest of us we didn't even know how we were suppose to look for relevant information, we only knew "yahoo" but he knew where we were suppose to go to find the information that we needed".  
(Interview 26, 186:193)

### 8.6.3 MAKING DECISIONS

The leader was also involved in the process of decision-making as shown in the next Figure 8.6.



*Figure 8.6- Leader's Involvement in Decision Making*

Interviewees reported that one of the leader's duties would be to make decisions on behalf of the group.

"I mean the only way you can really ascribe a leader in the on-line situation possibly is by the fact that somebody maybe inputs more and makes things to be done, asks for more things to be done, or decides on a few more things or whatever". (Interview 28, 358:360)

Additionally, interviewees linked decision-making with fast responses given by the group members. As the next interviewee comments quick responses relate to fast *Typing Skills*.

"Especially there was a person in the group who used to make decisions and the other members would follow. I think though that any of the other group members would also have done the same thing. The point was who was going to respond quicker and say it is going to be me this time".  
(Interview 07, 151:154)

However, it seems that the most important leader's involvement with the decision-making procedure dealt with its final stages. Interviewees reported that the leader had a very strong say during the process of the *final decisions* made in the group.

"It is normally one person. Once we all put it together it is up to one person to make the final decision and send it". (Interview 05, 171:174)

The involvement of the leader in the decision-making is also vital in cases of urgent decisions needing to be made. If an urgent decision had to be made on a certain matter, it was the leader who took responsibility for any problems emerging.

"If you have to make an urgent decision I don't think that it can be a common decision, I doubt it very much, it has to be the leader, definitely it has to be the leader, the co-ordinator because he is the one who gets the ideas, and decides what should be in and what should be out, he is the one who should know what goes wrong, and what goes right. I think that it is expected for him to bear the responsibility". (Interview 24, 236:240)

#### 8.6.4 EDITING

Editing was quite an important task that needed to be performed by the on-line group, as representing the final group's work. At the beginning of the coding procedure things were mixed in connection with the editing procedures. It seemed that the most of the time the leader would do the editing. However, there are some cases where another group member would take up this responsibility. It seems that there is a difference between the *Editor* as a Leader and the Editor himself or herself. As presented in the data the Editor was not always the leader, however, being the editor did not necessarily mean being the leader. Finally, there were also cases where the whole group did the editing.

##### *Leader- Editor:*

"The leader will be the one who will do the editing, it tends to be the leader, he will take everyone's work the he will put it all in one report". (Interview 40, 305:308)

##### *Editing done By the Whole Group:*

We'd just all read through it a bit and then contribute. I think you'd probably end up with most people having read through it to see if they thought it was what was necessary. (Interview 37, 321:324)

##### *Editor is a person other than the Leader.*

"Yes, a few days before the deadline we just sent all the things to one person and he or she would do the editing and would send off the final thing". (Interview 13, 129:132)

However, no matter who the person doing the editing was, a number of editing tasks had to be performed as shown in the following Figure 8.7.

One of the editor's first and most important tasks *controlling the on-line discussion*. Firstly, the editor had to *initiate* the on-line conversation:

"Yes, it was again this guy called Simon, who we said he could be a leader, he was the sort of person to start of a conversation but as soon as the ball was rolling everyone was picking up new points, and the group seemed that it had a direction it didn't need much of pointing at the right direction". (Interview 09, 270:273)

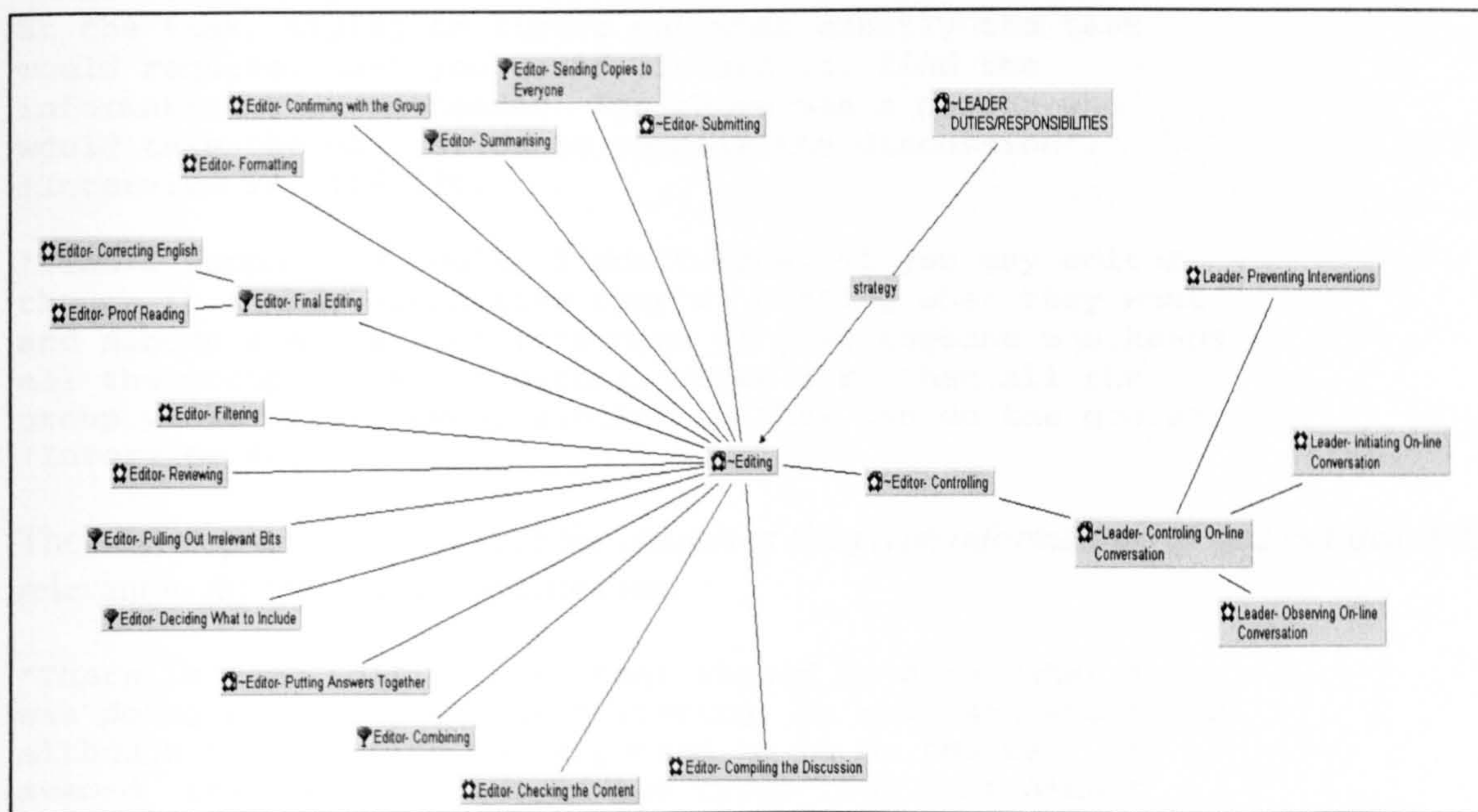


Figure 8.7- Editing Procedures Handled by the Leader

"I don't really think so, I think by the end of it we all knew each other well enough to say you do this bit because you are good at it, I would like to do this bit because I

*Observe the conversation* as it was going on.

"Whereas if they're on-line you can see what they have been saying anyway, so sometimes it's best to observe how the conversation's going before you actually jump straight in say something to someone". (Interview 30, 134:136)

Also *prevent interventions* in order to assure the flow of the conversation. As in the next quotation the typing skills are playing an important role in performing such a task.

"Yeah, yeah I do think so yes definitely, in order to prevent that no-one else can jump in, the leader will organise everything, therefore they what they are saying has to be said on time before somebody else bumps in. I think a leader can just sit back and watch what's happening and then interfere and then on-line there is no control is there? If you don't have a

leader constantly coming into it oh, you can't say that it's very difficult on line now with a leader because you can't really you can't see him". (Interview 38, 283:290)

As group members had to handle a project ready to be submitted by the end of the semester, they had to go through different stages. The very first step was to identify what was required from the topic, to have a discussion around it, and then to find relevant information on it. Therefore, a need for a person to compile all the discussion around the topic, so group members could have a clear view of what it was needed, and of what were the main themes raised from the discussion, was identified.

"What we usually used to do was that first we would look at the task, trying to figure out what exactly the task would require, then you would discuss it, find the information that we needed. The there was a person who would take the obligation to compile the discussion". (Interview 14, 116:120)

"Yeah I suppose so. Well, I don't know, if you say editor though it sounds again like they're getting what they want and nobody else is. But it's more of just someone who keeps all the group's views together, makes sure that all the group views are somewhat similar so they can do the goals". (Interview 44, 327:332)

The next step would be to *check the content of the given information*, to find out that if it was relevant to the topic under investigation.

"There is some editing work that should be done, what I was doing as an editor was filtering. We realised something, although the question was supposed to be on the web, it seemed that some members of the group they just didn't bother to read about it, so we had to make sure that the things we decided to include, the content is actually answering the question, otherwise we would be running out of a topic". (Interview 24, 173:184)

The following interviewee indicates that someone is needed to *put all participants' contributions together* and to try to make sense out of them.

"There must be a person who would do the editing, who would take everyone contribution and then it would put them all together. This person would collect everyone's contribution, put them together". (Interview 29, 170:173)

Reasons for the necessity of such a person were provided. As the groups usually consisted of up to six participants, that meant that there were six different people expressing their views and contributions on the topic. Six different people possibly mean six different opinions.

"You can do a report, there could be four different people writing the report and they could work in four different ways but at the end of the day, when the editor puts it all together he/she is going to find differences in there". (Interview 03, 367:369)

The next step of editing would be the manipulation of the ideas expressed. After all the information was gathered then there was a need for *pulling out the irrelevant bits of information*. The editor would have to narrow down the information in order to make contributions presentable.

"This person would change a few things, pull out the irrelevant bits, present the whole thing in a nicer way that it would make sense and then this person would sent the final thing". (Interview 14, 118:120)

"The editor - if everybody has different ideas, they all put them in the middle and discuss them, then he edits out the unimportant, useless bits and just keep the good stuff". (Interview 31, 146:148)

Alternatively, the procedure of *taking out of the irrelevant bits* would be again done by the editor with the help of the rest of group members. In this case of editing the rest of the group members would have to be involved in the discussion and agree on the key points presented.

"We basically put all our ideas together, send them to each other and assess them. Obviously you're getting everyone else's ideas. The co-ordinator would then tend to look at them all summarise them. Summarising you know all the key points just basically and then we would get it all back again. Then we'd be able to reassess it and say "this is what I think are some of the key points, that's what I think is irrelevant". Then we send it back again and the co-ordinator would then look at it all assess as to what the key points are in everyone's eyes and what the minor points are and then narrow it down to a better grasp of the information". (Interview 36, 587:594)

One of the other tasks that needed to be performed was the *formatting of the document*. Once again the editor would undertake this task.

"Probably it was because I've used computers for quite a long time and so I am very happy with using e-mail and also the word processor and stuff whereas other people in the group they haven't used it as much so I was quite happy for them to give me the work for me to format it or whatever.". (Interview 18, 189:192)

Interviewees also reported that the editor or the leader decided on the content of the group's work, in other words, on *what to include or exclude* from the final document.

"How do you decide what to send?  
The one person that sends it away we just trust him or her to send away wherever they feel.  
Don't you try to make a common decision on what to send?  
No". (Interview 35, 240:251)

"The person puts everything together and sends it. Although last week two of us did it, two of went and sent the e-mail off to the lecture, it just happens, it's day by

day. It's hard work. We do not try to have everyone to agree on what is going to be sent, that is being decided by only one person". (Interview 35, 262:265)

Even in those cases where interviewees admitted working collaboratively, it was finally the leader's task to decide on what to include and exclude.

"We did not actually divide the work we just worked collaborative, we would take each question and we would all give our opinions, we would type everything together and we would send it to the course leader. The leader was the one who would decide what to include and what to exclude in the final thing. Me personally I find that the leader says quite acceptable". (Interview 40, 343:349)

Group participants who took up the task of editing also decided on the content, but only after consulting the other group members.

"Yes, I had a go, Carlos had a go too, I think we built on his version, I just pinned everything together, I stuck at the Web Board and about 4 days later Carlos and I think it was Olivia was the other girl, they sent the version back to us - it was considerably shorter but it seemed to cover most of the major points. We then edited a little bit more and pinned it back up - they seemed pretty happy with it. There were a couple of things missing that they really wanted, so we put them back in. I guess the end decision was ours but it was a kind of shared thing, so it was OK". (Interview 25, 325:331)

Towards the end of the editing procedure the editor would have to perform the *final editing*. During the final editing, the editor needed to proof read all the documents prepared by the group members and then correct the English in order to make sense.

#### *Proof Reading:*

"Yeah actually he did but only because it needed to be on the web site, on a web page and you know nobody in my group had any other experience anyway. I always prefer somebody to come and have a look over my work anyway, because I think it is very difficult to proof read your own work, and you know, because you've spent so much time with it, it's very difficult to then spot mistakes after a while anyway. It does need a fresh eye and a fresh perspective". (Interview 48, 238:245)

#### *Correcting English:*

As noted in the following quotation, some of the group members were not native English speakers, therefore sometimes their English did not make any sense. Consequently, it was the editor's task to correct the English, construct the sentences and maintain sense making.

"I did the editing, but lots of the content would come from other students, some people they would supply to much information, I didn't expect so I had to cut it down and also I tried to correct the English a little bit more, because their English they weren't very good, there were



just a few people who there weren't English, so sometimes I was actually trying to understand the sentence's structure and what it was saying, so I did the best guess".  
(Interview 28, 243:250)

One of the other editor's tasks would be to *summarise* and give an abstractive form to all the detailed information given by the group members.

"If it is too much detailed or something we have to summarise it, to make more abstract, and once a draft has been done then it should be post so everyone can assess it, and the other members of the group they would have the opportunity to add or reject things". (Interview 24, 180:184)

### *Confirming with the Group:*

"And before sending compile it and send it back to everybody Before sending it to the teacher. So we could say all right This looks quite good we can send it now before the deadline".  
(Interview 06, 257:259)

### *Sending copies to everyone:*

What I found was when you meet a certain task I tended to say right you need to get this done we would try to split it up, we would say if everyone could do this bit there, this bit there and if everyone sends their stuff to me I will look through it I will finalise it, I will put it all together and then I will send you each back a copy, you can tell me if there any problems with it, if there is will try to change them, if there isn't we will try to send it on to whoever there is". (Interview 10, 145:150)

Yeah it is, yeah. It's always the same person that actually says, like when we're doing the web page and stuff like that, we would tend to look at web pages, send our comments off to each other then this person would come back and say "here's the list, what do you think to this?". Then we'd all look at it and send it back to him and he'd send it off".  
(Interview 36, 454:459)

The last thing the editor did was the *final submission* of the group's work.

"One particular person would be asked to take up a particular thing. Everybody would send their thing, he or she had to compile it and send it. Compile it, sorted it out, say what he or she thinks and send it. And before sending compile it and send it back to everybody before sending it to the teacher. So we could say all right this looks quite good we can send it now before the deadline".  
(Interview 06, 255:259)

"For instance, for the finding of the URLs and that sort of thing we have divided the task "you find this", "you find this", we went off and did it individually and come back and somebody usually formulate it. I had to take one task and then send it off, other times other people had to do this. That was generally the format, people went away,

found their individual piece, brought it back, somebody would edit it and then send it off".  
 (Interview 01, 326:330)

### 8.6.5 TIME MANAGEMENT

One of the most essential tasks a leader had to perform in the group dealt with *time management*. Because of the way the on-line communication is set, there is a serious chance that the group members will lose lots of valuable time. Therefore, there is a need for a person to manage the time spent by the group members on certain tasks.

"I think with the on-line communication you need someone to sort of organise other people because of the way e-mail and on-line communication works. Because everyone is sending e-mails at different times you sort of lose time. Someone could say to someone else do you want to do that and at the same time that person could send something to someone else saying would you like to do that. And unless someone actually assumes a position where they can organise someone else then it doesn't really work".  
 (Interview 10, 227:233)

"I am not so sure because maybe that times when you act as a member of a group isn't as such as if you have to only have face-to-face, so there is no e-mail no nothing in the traditional way, then it would have been more of a problem to actually trying to get everyone together, you need organisation, and the leader all the time who has to contact everyone and make timetables, so in that sense this required to spend less time as a group, which I felt wasn't actually that bad, the group still functions".  
 (Interview 11, 415:420)

The *Leader's Duties* involved in the performance of this task include the following as presented in Figure 8.8.

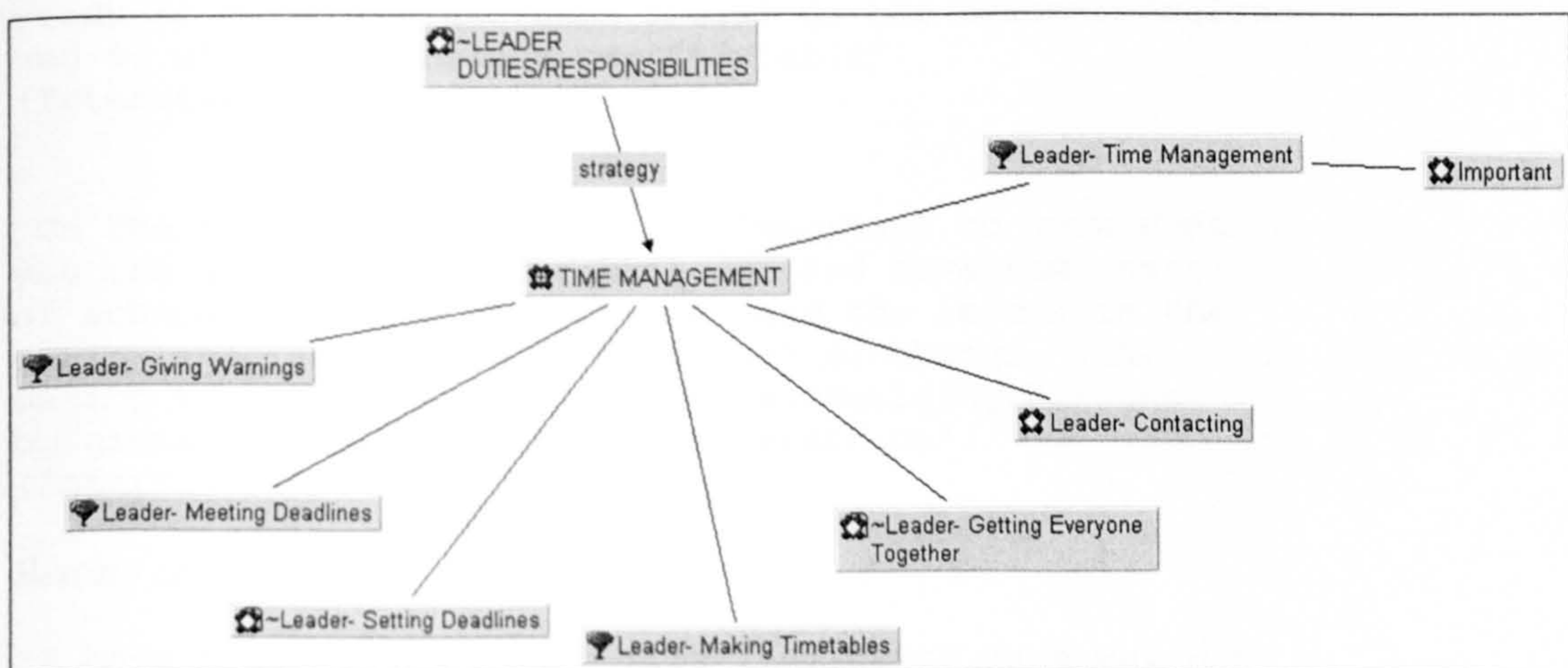


Figure 8.8- Leader- Time Management

Steps that needed to be taken by the leader relating to the handling of time management are as follows. Initially, the leader was responsible for *contacting* everyone in the group and letting them know about the forthcoming on-line meetings.

"I am not so sure because maybe that times when you act as a member of a group isn't as such as if you have to only have face-to-face, so there is no e-mail no nothing in the traditional way, then it would have been more of a problem to actually trying to get everyone together, you need organisation, and the leader all the time who has to contact everyone and make timetables, so in that sense this required to spend less time as a group, which I felt wasn't actually that bad, the group still functions".  
(Interview 11, 415:420)

The leader also took the responsibility of *getting all the group members together*. As explained by the one of the interviewees, taking care of the task of getting all the group together is a sign of responsibility.

"In one of the other groups there is a guy who would always send e-mails, who would set on-line group meetings , who would try to gather all the people together all the time. This person I believe that he is very dedicated on what he is doing and he is also very responsible, he wants everything to be done before the actual deadline, he wants everything to be done in advance, so that I think makes him a kind of an informal leader, because he is actually gathering everyone together". (Interview 39, 254:259)

The leader was also responsible for *making timetables*:

"Basically he or she would suggest dates, because it was such a large task we needed to have dates and then each section would needed to be completed by these certain dates. For example, section 2 to four needed to be completed before we can make any recommendations for further action. The leader would say we have to have them ready by this date and then I will do the recommendations and we will reorganise a new timetable".  
(Interview 15, 196:201)

"On the other hand, it is quite important to know what you can do and what you cannot do, and have some sort of schedule for the whole group, and the leader is the person who is going to do that sort of things, like making timetables and stuff, and summarising all the opinions expressed during the interaction".  
(Interview 26, 165:169)

*Setting deadlines:*

"I have done that in group work I am quite sure why but the truth is that I don't like to waste time and it is very easy with group meetings a lot of time to be wasted. I like to sort of set objectives for everybody to do and Set deadlines and say we will meet again next time and

such and such". (Interview 18, 178:182)

"I wouldn't hide myself away, so basically it was more and thing that I knew something had to be done by a certain time and you had to involve everybody, and if that responsibility fell to myself or Carlos or Gratsi, then OK that's fine. If no one else did it then I'd quite happily put myself in that position, I think we need some co-ordinator". (Interview 25, 204:208)

Being responsible for the group members *to meeting the deadlines:*

"Yes, we did. It just made it a lot easier having somebody to say lets do that this time, lets do this, we had a focus we knew what we were doing, when we were doing it, so we had targets because we actually had to face the deadline, so it is a lot easier to get the work done. So, what this person would do for the group? They just suggested we do a certain amount of work at a certain amount of time, like trying to meet the group deadlines, actually the course work deadline". (Interview 23, 146:154)

"This is highly debatable because it depends on the situation, lets say in a situation where you really need to get the work done then you really need a leader to move the whole group forward when you have to meet a deadline. If time is not really a constrain then I think that a more relaxed environment should be given to the group members". (24.txt - 24:22 (206:212)

Finally, the leader was responsible for *giving warnings* to the group members if they were not properly doing what they are supposed to. The nature of warnings a leader would give to the group aimed to save time for the group, and keep them in the timetable.

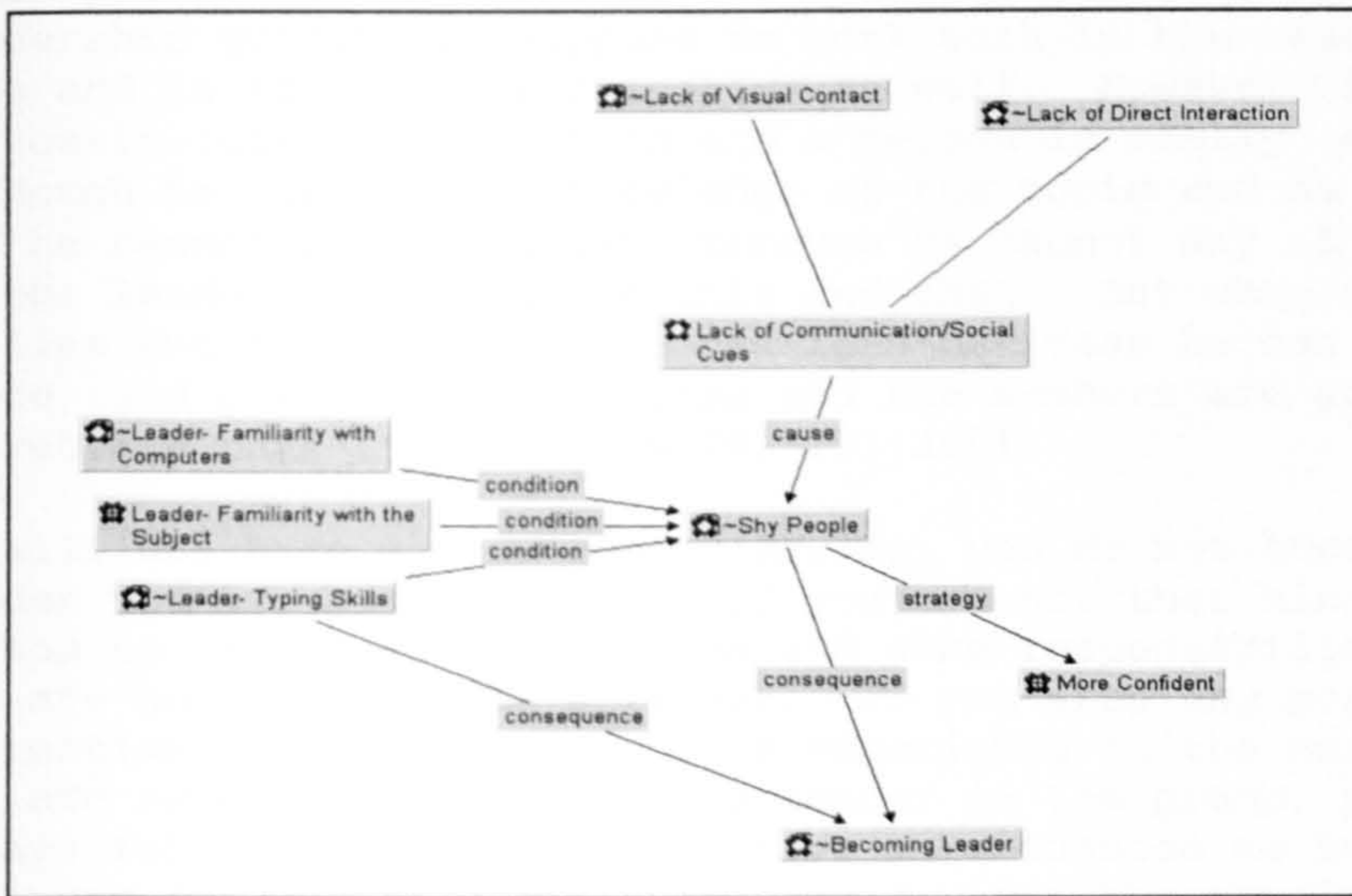
"I suppose choosing a leader would have been helpful just to give up tasks to the members also help warning people that they didn't contribute the amount of work they needed to contribute, just make people more equal and useful". (Interview 07, 224:226)

"This person would also try to make sure that the members of the group are focused on what they are supposed to be doing, he or she should give warnings if people are not keeping the timetable". (Interview 29, 177:180)

The leader was also involved into the solving of the on-line conflicts and disagreements among the group members (See relevant section in On-line Conflicts).

## 8.7 LEADERSHIP: ACTION/INTERACTION STRATEGIES: SHY PEOPLE

Data was provided in the interviews on the way the so-called shy students acted towards on-line leadership. Data revealed that group members considering themselves as "shy" reported themselves not only to participate more in the on-line environment than they did in face-to-face, but also not hesitate to take up the leadership role. Next step in our analysis was the identification of the reasons and conditions that affected shy group participants' attitudes towards leadership. As reported, direct interaction among group participants, a characteristic of the face-to-face communication, is the reason why shy people feel uncomfortable, therefore, hesitate to take up leadership roles. The reasons are shown next in Figure 8.9.



*Figure 8.9- Shy Group Participants' Attitudes Towards Leadership*

However, direct interaction does not exist as a factor in the on-line environment. Thus, the lack of direct interaction and visual contact made group participants feeling confident enough to become leaders.

*"You mentioned before that the co-ordinator of your group is quite a shy person, how do you think this person found the courage to do something like that?"*

*Because there's not as much face-to-face interaction and shy people I think in my eyes they probably don't like the social interaction for whatever reason and they may find it easier to actually deal with other people where it's not a face-to-face environment and all they're doing is talking to a computer as it were. They're not actually seeing the other people or communicating with the other people, they're just typing things in". (Interview 36, 533:540)*

*"Definitely, I think shy people would probably not try and dominate but they'd actually take the lead a bit more. I mean in our group, what we're doing at the moment, there's one guy that I've probably only actually spoken to literally*

three or four times. Actually spoken to him. But he's now co-ordinating all our group work, I've finished my group work off this morning and e-mailed it off to him. Someone else has e-mailed their group work and he's co-ordinating it all and he's going to put it all together and stuff like that and I think he's probably a very shy person. He's very introverted and he's actually taking the lead and doing the actual kind of the physical keying it all together and doing all the links and stuff like that. I think it's probably because he is shy and he doesn't really have too much to say in the kind of actual physical group work, in the lectures and things like that, he doesn't say a lot".  
(Interview 36, 236:245)

The on-line leader's duties do not involve any physical contact with the other group members, as the on-line leader only needs to type instead of speak to his/her peers.

"I am not so sure about that, if somebody has this kind of leadership quality is suppose to work both in the face-to-face and in the on-line situation as well. However, if it is a face-to-face communication and a person is really shy, although he has lots of knowledge on the topic and he is to shy he cannot be the leader, because he cannot say I want to be the leader, I want to do this and that. But when it is on-line and he is shy and he has lots of ideas he can just write, and present his opinions and the members are going to appreciate that". (Interview 26, 203:209)

"I will use here a very common saying, you do not become a leader you are born a leader, if you are not that kind of person to take some initiatives and some responsibilities you are going to become a leader. If you area shy person by definition even if you have some experience in the university you are never going to become a leader in the group, you will always follow the others. You have more chances to become a leader if you are a dominant person, even the physical appearance of a person affects leadership, of course all these factors have to do with the face-to-face interaction, in an on-line environment the things are a bit different. On-line a leader must have some sort of other qualities as well like being able to write and speak in a convincing way. This is very difficult to do it an on-line environment of course, if you speak on-line to a person that is in America for instance is very difficult to convince him or her on something, trying to convince someone might take a long time and it might cause some disagreements and misunderstandings as well".  
(Interview 29, 190:204)

As presented above, a shy person's attitude changes towards leadership in the on-line environment due to lack of direct interaction. However, some other conditions have to be met additionally for a shy person to be able to emerge as a leader and handle the roles required. Those conditions were identified as *Familiarity with the Computers*, *Familiarity with the Subject* the group is dealing with, and *Typing Skills*.

"Yeah I think so. If working on-line makes them more confident because they're good with the computers, they're good with the software, they can type quickly, they've got a bit of knowledge

about you know the subject, if they're working on-line then I think they're, it's more probable that they would become the leader than someone who might perhaps become the leader in a face-to-face situation". (Interview 41, 352:358)

## 8.8 LEADERSHIP: CONSEQUENCES

Interviewees identified initially the need for creating a leader during the on-line interaction, who would be responsible for the handling of certain tasks in the on-line group. Data revealed that if the leaders' duties were performed as stated, then a serious amount of time could be saved for the group.

"I am not so sure because maybe that times when you act as a member of a group isn't as such as if you have to only have face-to-face, so there is no e-mail no nothing in the traditional way, then it would have been more of a problem to actually trying to get everyone together, you need organisation, and the leader all the time who has to contact everyone and make timetables, so in that sense this required to spend less time as a group, which I felt wasn't actually that bad, the group still functions".

(Interview 11, 415:420)

"So, do you like this aspect having somebody who is on the lead? Yes, I do, it is essential I would say, very good, having someone who goes around the centre of the things, otherwise you just go around in circles, this way so you save time and effort".

(Interview 02, 258:262)

Additionally, the decision to set an on-line leader also led into better organisation of the on-line group.

"Because group work it is quite difficult to organise it, it is probably good that you will have a leader. I think it really depends on what the group is trying to achieve, you have a leader or consensus it is going to be quite difficult to reach". (Interview 28, 150:153)

"However, you work in the same level with the other peer students. The leader in the group would organise and administrate the other members of the group when there are time limits, he or she should also minimise the limits of failure of the project". (Interview 29, 185:188)

"He just organises it at the end making sure things are getting done really". (Interview 37, 310:311)

## **8.9 DISCUSSION**

### **8.9.1 CONTEXT**

Although the role of the leader has been traditionally given to the tutor of the electronic group (Kerr, 1986; McConnell, 1992), the present study revealed data shown that the role of the leader could be performed by one of the group members. The handling of the moderator's role undertaken by a student was also suggested by the literature (Mason, 1990; Mason, 1991b; Oliver et al., 1998; Aviv & Golan, 1998; Scifres, 1998; Ross, 1996).

During the interview the word "leader" was avoided when talking about the group member who co-ordinated the on-line interaction, in an attempt not to be judgmental through the use of a specific word. Hence, we used alternative words such as "facilitator" or "co-ordinator", always giving the choice to the interviewee to select the most appropriate word to describe the person who took on certain responsibilities in the group. Interviewees appeared to agree with our preference using alternative words such as "co-ordinator", "communicator", "go-between", "facilitator", "negotiator". In fact, the word "leader" was used quite often by the interviewees, a term they were familiar with from their past face-to-face group experiences and the literature. Words like "coordinator" (Ross, 1996; English & Yazdani, 1999), "moderator" (Kerr, 1986), "facilitator", "motivator", "mentor", and "mediator" (English & Yazdani, 1999) have also used in the literature.

It appears that in the majority of cases, when interviewees were asked about their preference concerning a name, the word "co-ordinator" would always come into the picture. The use of the specific word by the interviewees indicated a wise decision after all, as the word "leader" could give a negative meaning to the whole process of computer-mediated group interaction. On the contrary, the word "co-ordinator" which is quite a neutral term, indicates a person whose task is to organise and handle the group without the intention of actually leading it. By using the word co-ordinator, group members avoided the negative meaning, that the word "leader" could have by implying intention and possibly even an expression of authority. An on-line group based on educational settings, as expressed by the interviewees, is not based on the practice of authority and leadership of only one group member.

The word "editor" was also used to describe the person who took up certain responsibilities in the group. In fact, the use of the specific word, as it connects immediately to the nature of on-line text-based communication seems to be a very appropriate one. On-line group communication is mainly based on the written form of communication. Therefore, the person who became the "leader" was be the one who handled the editing procedures in the group.



## 8.9.2 CAUSAL CONDITIONS

Interviewees identified a number of conditions linked to the group members' realisation of a demand for a leader. The two codes linked with that were called *Time Management* and *Need for Organisation*. Interviewees reported that the on-line interaction proved to be a time consuming procedure. Therefore, group members attempting to prevent any further time loss came up with the idea of a co-ordinator, who would prevent a further waste of time.

On the other hand, the realisation of the need for leadership was connected to another "time" feature. Data revealed that this became even more evident as the deadline for the submission of the group's project report approached. In order to become more concentrated and serious about group work, group members decided to create the role of leader. *Leadership Need* was also found to be related to the asynchronous mode of on-line communication. During the asynchronous mode, when group members send inputs and contributions at different times, a greater need for organisation and leadership was identified.

However, data also emerged during the interviews acknowledging the fact that sometimes there was no need for a leader. The identification of the lack of need for a leader was found in relation to the code *Face-to-face Leader*. Additionally, some of the quotations still referred to the on-line leader as well. Closer attention to the quotations revealed a number of conditions linked to the realisation that there was no need for a leader in the on-line group. The most important reason influencing group members' attitudes towards a possible leader focused on the *existence of the co-operative group*. If group members cared about the group, and co-operated with each other, then the necessity for a leader faded away. Interviewees tried to define and describe a co-operative group. They seemed to agree that, when group members are being responsible and willing to get involved in the group's tasks, they eliminate the need for a leader. The group members' experience of group working also seemed to be one of the parameters. Additionally, equal contributions by all group members seemed to assure them that there was no need for a leader. Finally, another reason mentioned by the interviewees was linked to the way an academic environment works. Interviewees noticed that there was no need for a leader in a learning environment where everyone was perceived to be equal, i.e. there was no need for someone to give directions and judge their peers. After all, a learning environment is supposed to provide students with the opportunity to experiment in certain fields and learn by experimenting.

Apart from the above reasons, interviewees reported some other conditions linked with leadership necessity. *Leadership Necessity* depended on *Group size*; the smaller the group the less the necessity for a leader, and on *Task Complexity*. As a task reached completion the

group members might decide to assign a leader who had not been needed earlier on when the task was in its initial stages.

However, data also revealed some cases where group participants admitted *volunteering* to take up leadership tasks. A number of reasons provided by the interviewees explained such an attitude. Initially, a personal need for maintaining control over the group, and making sure that the group functioned properly, was reported as a reason. Control maintenance was aimed mainly at the prevention of other group member's interventions. It also seemed that certain group participants enjoyed organising other people. This condition was linked to experience from previous group situations. Part of organising the group members was also preventing wasting time. A prospective leader was willing to take up certain tasks in order to prevent valuable time being wasted. Additionally, the personal need of certain group members to become leaders was connected to the pre-defined time limits within which the group had to work. Finally, there were some cases where group members reported taking up the leadership role for the simple reason that nobody else did.

However, there were a few cases where group members refused to take control over the group organisation. The reasons given included the extra work involved and the extra pressure on the person performing such tasks. Interviewees also admitted that it could be difficult to motivate people to work properly in an on-line environment, and this was one of the leader's responsibilities.

A set of conditions were also identified and linked to the natural *emergence* of the *leader* in the group. In those cases the leader had not been identified as a necessity for the group and he/she had not offered himself/herself for leader. A number of conditions had to be met for a certain person to arise from the group and assume the leadership role. Initially, the person who made the *greatest contribution* to the group was more likely to be the one to emerge as leader. Additionally, *Familiarity with the Subject* was determined as being another reason. Background knowledge about the subject under investigation and the quality of input and information supplied to the group are considered to be very important factors influencing the group's decision to give the co-ordinator's role to a specific person. The explanation given by the interviewees connects prior knowledge to the provision of *new* and refreshing *ideas* when needed. The prospective leader also had to show signs of responsibility in order to gain group's trust.

### 8.9.3 INTERVENING CONDITIONS

The interviewees identified a number of intervening conditions facilitating the leader's performance of tasks. Initially, the code *Familiarity with Computers* was found to affect the group's decision to assume a leader. A fair level of familiarity seemed to be needed in order to make the leader feel comfortable and confident enough to perform the tasks and duties needed for the group. Familiarity with computers was considered vital by the interviewees. It was also used by the prospective leader to make an impression in the group and therefore gain the group member's confidence that he/she was adequate to perform the tasks needed.

Additionally, *Familiarity with the Software* was considered to be another factor among the intervening conditions effecting the *Leadership* category. However, familiarity with the software was not considered to be as important a factor, as familiarity with computers and hardware were. Explanations given by the interviewees addressed the "friendliness" of the newly developed software, which is user-friendly and easy to learn.

On the other hand, the leader's *Familiarity with the Subject* was considered to be quite an important factor for the provision of guidance and the supply of new ideas when needed by. Prior knowledge helped build the leader's confidence and would lead to the emergence of the group co-ordinator. However, some interviewees identified the difficulty of defining someone's knowledge of a specific topic in the on-line group. In addition, a number of cases were identified in the interviews where prior knowledge was not found to be necessary as it was thought to defeat the learning process. Interviewees reported coming to the university in order to learn and experiment. Prior knowledge of some members could spoil such experimental learning. Also, a group participant holding a great level of familiarity with the topic under investigation was more likely to try to dominate the group.

Furthermore, the code *Typing Skills* was found to affect the *Leadership* category, as group participants with fast typing skills felt more confident and therefore more likely to become leader in the on-line situation. On the contrary, slow typists did not give the impression of being able to handle the group, as what is required by the leader is to be able to intervene when needed, assuring smooth group interaction.

Finally, The code *Writing Skills* was placed with the intervening conditions of *Leadership* category and referred to the written form of communication, the use of language. Interviewees identified the need for developing writing skills, considered to be essential for validating someone's presence in the on-line group and for making sense. The leader requires an effective use of the English language in order to make sense to the rest of the group. Writing skills were considered to be even more important than typing skills.

## 8.9.4 STRATEGIES

After the leader had emerged in the on-line group through a number of procedures, he/she would have to perform a number of duties. The leader's tasks and responsibilities were divided into five main categories namely: *Manage-Organise, Inform, Decision-Making, Time Management* and *Edit*. Different roles and tasks undertaken by the teacher or tutor in computer conferencing have also been discussed in the literature (Feenberg, 1986; Brochet, 1989; Davie, 1989; McCreary, 1990; Eastmond, 1992; Berge, 1992; McMann, 1994; Paulsen, 1995; Berge, 1995; Berge, 1997; Mason, 1991b; Hiemstra, 1994).

Interviewees stressed the need to have an organising principle, as group participants sent inputs to assist group communication and particularly when the group had to work within pre-set time limits. Initially, the leader was responsible for the *Division of Labour* and if he/she had a fair background knowledge on the topic then he/she could possibly provide group members with guidelines on how to deal with the topic. The criteria used by the leader during the procedure of the *Division of Labour* were based on group members' personal preferences and on the identification of group members' specialities or expertise (if any). The interviewees reported that the final group product was possibly better when group participants were more focused from the initial stages of the on-line interaction. However, this could also have its drawbacks as it could eliminate the learning process, which includes learning by experimentation. The organisational duty of the leader should also involve the *setting of priorities* and the *assurance* that group members are *handling equal tasks* so there is no disproportion in the *Division of Labour*. Assurance of the equality of tasks was reported to be a harder task to handle in the on-line environment as it is harder to maintain self-discipline. The leader was also responsible for *assuring the participation* of all the group members, helping them to *remain focused* on the tasks, so *no valuable time was lost, giving directions* or *providing* them with *new ideas* when needed, and making sure that the group tasks were performed.

The next set of leader's duties involved the *supply of information* on the group tasks and needs. Firstly, the leader made sure that everyone in the group was informed about the process of the group project, and also about the other groups' work progress. Additionally, some interviewees reported that the leader should show the way of finding information to the rest of the group members. In handling such a task the leader should be assisted by his/her *Familiarity with Computers*.

Furthermore, interviewees reported that the leader should be heavily involved in the decision making process, possibly having the last word in the *final decision*, and being responsible for *urgent decisions* which needed to be made.

Moreover, the leader should be responsible for the handling of the *editing procedures* in the group. It is not very clear from the data who managed the editing procedures in the group. They seemed to have been carried out either by the leader, or another person in the group or the whole group. However, no matter who was the person handling such tasks, a number of tasks should have to be performed. The *editor* was responsible for *initiating, controlling and observing* the on-line discussion, *preventing interventions* with the aim of keeping the flow of the conversation. Therefore, *Typing Skills* played an important role. The editor was also responsible for compiling all the points of the discussion so group members had a clearer view of what was needed, and what the main themes raised during the discussion were. The next steps would be to *check the content* of the given information, *putting* group members' *contributions together* and trying to make sense of them, *pulling out the irrelevant bits* with the intention to narrow down the information into a presentable form. It has been suggested that this final task should be done by the whole group to make sure that everyone agrees on the key points presented.

A number of other steps should also be taken before the final submission of the group project. A decision on the content of the *final document* had to be made. This could be done either by the leader or the whole group. Additionally, the final editing of the document had to be carried out such as *proof reading, correction of the English language, summarising, confirmation* from other group members and the *final submission* of the group's work.

Finally, one of the most important and essential tasks a leader had to perform dealt with *Time Management*. Because of the way on-line communication is set, there is a serious risk that group members will lose valuable time. Therefore, there was a need for one person to manage the time spent by group members on certain tasks. The leader had the task of *contacting* everyone else in the group and letting them know about forthcoming on-line meetings, being responsible for *getting all the group members together*, making *timetables, setting deadlines*, being responsible for group members *meeting the group's deadlines*, and *warning* group members when the timetable was not being adhered to.

Data from the interviews revealed an interesting result. It seems that group members who considered themselves "*shy*" reported not only to participating more in the on-line environment than they did in face-to-face groups, but they also did not hesitate to take up the leadership role. The next step in our analysis was the identification of the reasons why and under what conditions shy group members felt confident enough to take up the leadership role. *Shy Participants* cited the *lack of direct interaction and visual contact* as the main reason which made them feel more confident and consequently helped them to become leaders. Additionally, interviewees noted that the needs of the on-line group towards the leader are different from those in the face-to-face situation. Therefore, the on-line leader's

duties are different as well. As the interviewees mentioned the on-line leader's duties do not involve physical contact with the other group members. The on-line leader does not have to have a direct and physical interaction with his/her peers, he/she just needs to type. However, some other conditions do have to be met, such as *Familiarity with Computers*, *Familiarity with the Subject* the group is dealing with, and *Typing Skills*.

The procedure of the leader's emergence and performance of tasks, as described above, was found to result in time saving and better organisation and handling of the on-line group.

# **CHAPTER 9:**

## **LACK OF COMMUNICATION CUES**

## 9. LACK OF SOCIAL AND COMMUNICATION CUES

During the data analysis a code was found to appear again and again named *Lack of Social Communication Cues*. The code included quotations referring to the effect the absence of social and communication cues, such as use of body language, direct visual contact, use of gestures, tone of voice etc, had on the on-line group interaction. However, the code did not form a category developed along with its conditions and strategies and consequences as the rest of the codes were. In the most of the cases the code, linked immediately with the on-line environment, appeared to be a condition that caused changes in group participants' attitudes. During the final stages of data analysis we began to realise that this code was linked to all the categories arising from the data. In a way the lack of communication and social cues caused by the on-line environment was recognised as the essential "cement" that could stick all the other categories together. The relationship between this lack of communication cues and the rest of the categories is explored in this section.

### 9.1 LACK OF COMMUNICATION CUES IN RELATION TO EXPRESSION

The lack of communication cues is mainly the reason why group participants found themselves expressing differently. In a way they felt more confident expressing themselves during on-line interaction.

"Yes, I think I am more confident on-line to speak about things and discuss different things than face-to-face.

*Why do you think this is happening?*

I suppose because you don't see people's faces".

(Interview 15, 101:106)

*"Do you find that you express yourself on a different manner when you are on-line and face-to-face?*

Partly, it depends who you are with. If it is somebody you don't know then if you are face-to-face you might be a little bit less confident. Whereas on-line because you don't have to be face-to-face you can sort of be more confident because they don't look at you and they don't judge you sort of thing. Whereas if it is people you know, you know them already, you are more likely to have already communicated face-to-face so therefore you, your personality just goes into your on-line situation as well".

(Interview 10, 110:118)

As explained previously the group participants felt more confident because they did not have to face their peers face-to-face. Instead of talking and facing their peers all they had to do was type their contribution. The next quotation is very demonstrative as it manages to



illustrate and summarise a number of issues linked with the way group participants expressed themselves.

*"Do you find that you express yourself in a different manner when you are on-line?"*

Yes, because as I said in the group it is more formal because you don't want to offend anyone so I am more careful about what I type, it is restricted to work. Having said that it is because you actually meet the people and you are working with them, when I share IRC with people who I don't know and I won't likely meet then you tend to, well I don't know. OK, let's talk about people I do know when I IRC with them it is very spontaneous especially if I know them very well, you just type down what you think, because I am quite good in typing so I can just type as it comes and I like seeing the words on-line actually, it is like making your thoughts more clear, it is like actually visualising it on screen which is what it is. Sometimes when I am joking it sounds like a normal conversation because my friend isn't here, they are somewhere else but you still want to talk to them and this is a very cost effective way, method of reaching them. Also the other thing I like is that I can keep a record of the things I send and receive, I like keeping it because I am a letter writing person as well and this is like pretty close to it. Afterwards I don't know what to do actually because sometimes afterwards it doesn't make sense but you can keep it and it is just you talk and you can use your humour that your friend will understand, so that is like our own language".

(Interview 11, 158:181)

Expression in the on-line environment was found to be particularly useful for shy group participants and non-native speakers who had more chances of expression due to anonymity and lack of communication cues.

"Yes, I do feel differently I feel more confident to speak and express my ideas, I am shy on-line, that has to do with my English, my English is not perfect so sometimes when I am face-to-face I am afraid to express my opinion because of my English. But when I am on-line things change, I just type what I want to say. I am not consider myself as a shy person, but I can be shy and be afraid to express my opinion if I am face-to-face. So, I believe that people who they do not have English as their mother tongue they would prefer to be with the members of their group on-line. But of course it also depends on the type of work or project they have to produce when they are collaborating on-line, it depends on the other members of the group if they have the skills to work in an on-line environment, if they have the facilities". (Interview 39, 88:97)

*"Do you think that you feel differently when you are communicating face-to-face and on-line with the members of your group?"*

I think you do, I think it is a lot different because when you are on-line perhaps you would talk about things you wouldn't say face-to-face, because you don't have to see

them face-to-face. If you say you shy for example you can sort of start writing about things rather than try to bring up the conversation and say who is going to do what, you just say who is going to do what, type it in and then you can wait for your response. So, it is much more, I mean you can be more confident on-line compared when you are face-to-face. But then again there is different ways to get your answers. Whereas face-to-face you get your answers straight away but sometimes if let's say you are using e-mail you then have to sit there and wait until the response will come back to you". (Interview 10, 85:96)

*"Is anonymity, lack of visual contact making you feel more comfortable in the on-line environment?"*

I think it does really - you can't see people's reactions as well so if you are face to face they clearly disagreed with you, you don't know that with a computer you probably carry on saying something - if you're face to face with someone you would probably realise the person's reaction might change what you doing. With a computer you would be more likely to argue your point or something like that I reckon". (Interview 37, 139:146)

On the other hand, group participants had to overcome other problems linked with the lack of communication cues. They had to apply certain strategies in order to prevent being ambiguous, they had to be able to be precise and clear of what they were saying.

"When you're actually using on-line communication for the first time, if you haven't actually met the people before, if you can't physically see them, I think you're always a lot more cautious with what you're saying and stuff like that because when you actually meet people and you can see them, you tend to be able to assess fairly well what kind of person they're going to be and how you can actually get on with them. So if you can't actually physically see them you've got no idea what their kind of social background is, what their appearance is and what kind of social group they fall into. It's very hard to actually kind of pitch the language at the right level and stuff like that so it's not always as easy to communicate quickly and effectively in the first instance". (Interview 36,82:90)

"I don't know sometimes I can get lost in the words you know, maybe because you know it makes you more tired I don't know you get something that it's not so clear on line, it's not clear face to face maybe you feel more involved you know more a part of a group when you are on-line I think you deal very much on your own and that may interfere with really expressing your thoughts.

*What you mean more clear?*

When you are face-to-face you feel that other people maybe sometimes it can be encouraging you know so when you are speaking and people encourage you and they look interested in what you are saying. Then you can speak more but sometimes on line you are not sure what the other person maybe thinking because you cannot see their face and you might very conscious about what you are writing

*Does this have to do with the lack of the visual contact?*

Some people though won't find this a problem I think because they don't rely so much on visual expressions. I am a very visual person so this is what is to do with it as well. I rely on a lot on what I see you know to, facial expressions to tell me about what someone is thinking about". (Interview 38, 83:104)

"When you are face-to-face you feel that other people maybe sometimes it can be encouraging you know so when you are speaking and people encourage you and they look interested in what you are saying. Then you can speak more but sometimes on line you are not sure what the other person maybe thinking because you cannot see their face and you might very conscious about what you are writing". (Interview 38, 93:97)

## **9.2 LACK OF COMMUNICATION CUES IN RELATION TO PARTICIPATION**

The lack of communication cues was also found to affect participation. Group participants apart from the fact that they were needed to develop new ways of expressing themselves, they also found that they participated in a different manner, feeling more liberated. The lack of communication cues was found to be particularly suitable for shy or introvert group participants. Introvert people admitted that they did not hesitate to participate when they were on-line.

"I think you do, I think it is a lot different because when you are on-line perhaps you would talk about things you wouldn't say face-to-face, because you don't have to see them face-to-face. If you say you shy for example you can sort of start writing about things rather than try to bring up the conversation and say who is going to do what, you just say who is going to do what, type it in and then you can wait for your response. So, it is much more, I mean you can be more confident on-line compared when you are face-to-face. But then again there is different ways to get your answers. Whereas face-to-face you get your answers straight away but sometimes if let's say you are using e-mail you then have to sit there and wait until the response will come back to you". (Interview 10, 87:96)

"Well, I do I tend to be more outgoing on-line than I do when I am face-to-face mainly I think because they cannot see me because I think that the lack of it is that you read what the people look like and what they are doing so I tend to be more shy face-to-face but I was more confident on-line and more chatty but it sort of ended up the same because I just generally a very chatty person and when I get to know somebody face-to-face I am very chatty and when I know somebody through e-mail or something I am very chatty then so I would reckon that it is a quicker process

on the Internet but it ends up about the same".  
(Interview 17, 147:154)

"Shy people are more likely to participate on-line because when you are on-line the only thing you have to do is type, you do not care to whom you are speaking, you just type and then you press enter so you do not feel that you are interacting with somebody, and you feel to intervene in someone conversation, you do not see people's faces so you are not feeling very shy". (Interview 40, 203:208)

### **9.3 LACK OF COMMUNICATION CUES IN RELATION TO LEADERSHIP**

The on-line environment seemed to affect leadership procedures as well. It seems that once again a special category of people, the ones who called themselves shy managed to maintain an existence on-line and also become leaders. However, a number of other qualities were found to be needed as conditions for the leader emergence, that deals once again with the fact that we were dealing with a text-based environment. Those conditions were identified as writing, typing skills along with familiarity with computers and the subject.

"If somebody has this kind of leadership quality is suppose to work both in the face-to-face and in the on-line situation as well. However, if it is a face-to-face communication and a person is really shy, although he has lots of knowledge on the topic and he is to shy he cannot be the leader, because he cannot say I want to be the leader, I want to do this and that. But when it is on-line and he is shy and he has lots of ideas he can just write, and present his opinions and the members are going to appreciate that".  
(Interview 26, 203:209)

"If you are a shy person by definition even if you have some experience in the university you are never going to become a leader in the group, you will always follow the others. You have more chances to become a leader if you are a dominant person, even the physical appearance of a person affects leadership, of course all these factors have to do with the face-to-face interaction, in an on-line environment the things are a bit different. On-line a leader must have some sort of other qualities as well like being able to write and speak in a convincing way. This is very difficult to do it an on-line environment of course, if you speak on-line to a person that is in America for instance is very difficult to convince him or her on something, trying to convince someone might take a long time and it might cause some disagreements and misunderstandings as well". (Interview 29, 1955:204)

"Definitely, I think shy people would probably not try and dominate but they'd actually take the lead a bit more.

I mean in our group, what we're doing at the moment, there's one guy that I've probably only actually spoken to literally three or four times. Actually spoken to him. But he's now co-ordinating all our group work, I've finished my group work off this morning and e-mailed it off to him. Someone else has e-mailed their group work and he's co-ordinating it all and he's going to put it all together and stuff like that and I think he's probably a very shy person. He's very introverted and he's actually taking the lead and doing the actual kind of the physical keying it all together and doing all the links and stuff like that. I think it's probably because he is shy and he doesn't really have too much to say in the kind of actual physical group work, in the lectures and things like that, he doesn't say a lot". (Interview 36, 236:245)

## **9.4 LACK OF COMMUNICATION CUES IN RELATION TO DECISION-MAKING**

Due to the lack of communication cues (on-line environment) group participants felt that they had to spend lots of time making a decision. In other words, the decision-making procedure was found to be time consuming. Therefore, in lots of cases they decided to meet face-to-face when they had the chance in order to make an important decision.

*"What about the procedure of the decisions making, when you had to do a specific task. Did you have a certain way of acting?"*

What has been happening so far is that we have a task, and then somebody will start e-mailing the rest four normally, normally not me actually, I only respond. We also trying to do the task, if it is a matter of finding a web site, then that was quite straight forward, everyone just contributed once and one of us just said shall I send a list then, and everybody would approve and we would get copies. After we did this main project we had this slight problem of not knowing who was going to be in at what time, how often people check e-mails, or some of them went on holidays and so on. So, we just said we will meet face-to-face today. Everybody did their bit first, we did exchange some ideas, especially between me and another girl. I think we are going to get together and discuss the conclusions and the overall, just linking everything together, and that is about it, the piece of work. Mainly, everyone just doing their own thing, there is a bit of discussions on-line, but we quite had control of the group. There isn't anybody who is not being co-operative, not wanted to do anything. I mean there is a difference between saying you do this and having actually done it but I think it worked pretty well".

(Interview 11, 256:272)

"I do feel the need to meet face-to-face because the members of my group you find it very difficult to put everything we wanted together if we do not meet face-to-face. It seems that you repeating the same ideas again and again, and that

is very time consuming and you do not make something out of it. On the other hand, we used to work facet-to-face we have experience on how to do that, so it is easier in a way to mix on-line and face-to-face working".  
(Interview 39, 164:169)

"Somebody is typing and we are all chucking in things while someone 's typing, and different times different people type different things, there isn't a leader. But it doesn't mean that one person who is typing is putting all their effort into it, they are saying what other people think and then confirm with the group, "shall I say this then", "is this right", taking all the ideas and that's why it's easier face to face because at the end of the day you need to come face to face I think to actually come to a decision. Because in on line it's just not easy to see the whole picture". (Interview 38, 337:343)

## **9.5 LACK OF COMMUNICATION CUES IN RELATION TO CONFLICTS**

The lack of communication cues caused misinterpretation then possibly some misunderstandings. Eventually it might lead to conflicts.

"Even with people you know, I mean sometimes you need to clarify something afterwards, because it does need clarifying because people read it differently and there is no inclination which is one of the disadvantages".  
(Interview 11, 131:134)

"Er, yes you have to think well before you actually write something, how it's going to be perceived by the person who's reading it. There's a lack of like, er, body language so you have to either spell things out really clearly when you're talking to somebody or try not to say things that might offend people in some ways because it can be taken the wrong way". (Interview 30, 59:63)

*"What would be the usual cause of an argument in the on-line environment?"*

I suppose if somebody wasn't participating, then maybe the rest of the group or ... well just if it was like, I don't know, two people, the other people would say "look, you're not doing anything", "why aren't you doing anything?". I think that would be the main cause of an argument on-line. If it was a pure on-line you'd never met the person before and you didn't know them very well, then one person could perhaps write something down in a way that would offend the other person or crack a joke that they meant as a joke but the other person takes seriously. You know, like "oh I can't believe you've done all that work, it's a load of rubbish" but as a joke. You know, someone else might take it you know like a sarcastic joke the other person might say "oh, oh my God, they think it's a load of rubbish". So yeah, I think

Like misunderstandings from lack of body language and things like that". (Interview 41, 465:476)

"We had lots of conflicts, I think that the main reason what caused them were the misunderstandings. For instance, we post that draft copy of what we did on the web site and some of the students they misunderstood, they thought that it was the final copy of the work, and that we were going to submit it without asking for their consensus. But we actually put it as a draft copy and what happened was that they complained to the supervisor and he got back to us saying that this was not acceptable, that was one of the major conflicts that we had". (Interview 24, 244:250)

As explained before the code named *Lack of Social Communication Cues* appeared as a repetitive theme throughout the on-line group interaction representing a horizontal element effecting all categories. The links between this code and all the other categories namely *Expression, Participation, Leadership, Decision-Making* and *Conflicts* have been presented above and were taken into consideration in the next Chapter 10. There, the code *Lack of Social Communication Cues* is presented as the cause affecting the on-line group interaction by using the Grounded Theory Approach.

The lack of everyday social and communication cues, caused by the text-based nature of computer conferencing is one of the most important issues referring repeatedly in the literature (Sproull & Kiesler, 1986, Kerr & Hiltz 1982; Kiesler et al., 1984; Feenberg, 1989; Sproull & Kiesler, 1986; Hettinger, 1995). The role of the absence of social and communication cues appears in connection with the expression of uninhibited verbal behavior (Collins, 1992); encouragement of misinterpretation and miscommunication (Schaefer, 1997; Brouwer, 1997; Berge, 1997; Moore, 1993); flaming (Wang, 1996; Shapiro & Anderson, 1985; Berge, 1997); encouragement of participation (Alberktson, 1995; Rimmershaw, 1999; McConnell, 1990); exchange of polarised arguments (Kiesler et al., 1984); expression of extreme opinions in the CMC group (Siegel et al., 1986).

On the other hand, lack of social cues is blamed to focus the group participants' attention mainly on the content of the written messages (Kiesler et al., 1984; Siegel et al., 1986). According to Kiesler (1992) the lack of social and contextual cues is influencing group dynamics and furthermore the decision making procedure. Scifres et al. (1998) also connected the lack of the social cues with an increased chance of misunderstandings and conflicts.

# **CHAPTER 10:**

**SELECTIVE CODING,  
CONCLUSIONS AND  
POINTS**

**FOR FURTHER RESEARCH**



# 10. SELECTIVE CODING PROCEDURES AND POINTS FOR FURTHER RESEARCH

## 10.1 SELECTIVE CODING STEPS

According to Strauss and Corbin (1990) the researcher needs to execute a number of steps during the selective coding procedures in *Grounded Theory*, such as define the story line; identify the core category as the essential "cement" putting together all the components of the theory; relate other categories to the core category by the means of the paradigm identifying which category relates to which part of the paradigm.

Our procedures for selective coding were as follows:

The present study started with a general interest to investigate the issues arising from and factors affecting on-line group interaction in computer conferencing. The central phenomenon of interest was the identification of ways in which group members interacted with each other and features, issues, and characteristics of such interaction.

During the process of the interviews we started to realise that the interviewees would start talking more and more about the dynamics developed in the group. The questions concerning the dynamics were the ones providing the most interesting material. Therefore, we realised that our story line would involve the presentation of the group participants' opinions about their on-line interactions with a special focus on the group dynamics and the factors influencing those dynamics. Eventually, data was coded and developed around five categories namely: *Expression, Participation, Leadership, Conflicts* and *Decision-Making*.

## 10.2 CODE INTERRELATIONS

The previous chapters have presented the main elements of the proposed model. This section should be seen as the first level of a more abstract analysis of the relations among the categories. This section, although, it seems to be very detailed aims to demonstrate how codes interrelate to depict what happened in a real group interaction. Codes are not presented as stand-alone cases, they are rather interwoven to depict real life. Therefore, what seems to be a consequence for a category could be a condition in another. As Strauss and Corbin (1990) commented "the consequences of one set of actions may become part of the conditions affecting the next set of action/interactions occurring in a sequence- or even part of conditions that follow in still another sequence. Therefore, what are consequences of action/interaction

at one point in time may become part of the conditions in another" (p.106). The interrelations among different codes are presented next.

The code *misinterpretation* and therefore misunderstandings caused during the on-line interaction that has been placed as a consequence of the way group participants expressed themselves was also a major cause of conflicts.

The code *chaotic communication* that was also a result of the way group participants expressed themselves was also a cause of losing control during the interaction. Due to technical problems that can lead into chaotic communication group participants risk to lose control over the environment.

The code *flaming* was both used as a consequence in the expression and conflicts categories.

The code *visualisation* that initially came from the *Expression* category as a contextual condition seems to be one the most important codes connecting to a number of categories. In the *Expression* category the code was used and linked to a number of other codes. For instance, it helped group participants to edit their contributions, to make their thoughts more clear, to more easily support their arguments through visualisation of the actual arguments, to make corrections, therefore exclude repeated points and arguments and as a consequence to avoid misunderstandings and arguments. Firstly, the code appears in the participation category where it was found to assist the group participants to determine and assess the quality of participation of their peers. It is also used by the group participants to determine non-participation in the group. The code was also linked to the discussion that was a strategy used when participants had conflicting ideas or they were in the process of the decision-making procedures. Visualisation was also connected to the consensus code that was one of the results in decision-making.

The code *reducing interruptions* presented with the expression core category was connected to the so-called *shy* group participants. The code containing quotations of the ways shy participants acted and interacted in the on-line group is linked with: a) the expression category, as it seems that shy participants would have more chances to express themselves in the on-line group due to the lack of communication cues and lack of direct interaction, therefore they would become more open and they would manage to make more detailed points, b) by doing the above shy group participants would have more chances for participation and even contribution in the group, and c) finally the code of shy group participants would also connect to the leadership category, as it seems that even introvert group members would manage to become leaders in the on-line group, something would be considered inconceivable in a face-to-face interaction.

The code *being careful* used as a strategy in the expression category was also a strategy used by the group participants during conflicts. Therefore, interviewees admitted trying to be careful when they were expressing themselves and when they had conflicting ideas in an attempt to avoid arguments.

There was also another code named *somebody you don't know* as a property of the *group composition* code. The code seemed to be connected mainly to the expression category. More specifically, group participants needed to be more clear with people they did not know in the group, therefore more careful of what they were saying to them and consequently more formal and polite. The code was also related to the lack of conflicts during the on-line group interaction, as group participants felt that they could not really disagree and have a conflict with someone they did not know. The code would also be a problem for the participation category as it could lead into unequal participation.

The code named *discussion* is also connected to a number of categories. Discussion is initially stimulated by the code of visualisation in the *Expression* category. It seems that the fact that group participants can see whatever they are writing and they can also see their peers' contributions stimulated discussion in the group. Discussion was also used as an action strategy during the decision-making procedure, during conflicts, and as a reaction in cases of non-participation in the group.

The code *sense-making* is one of the results the group participants are trying to establish but is was also one of the results the potential leader would try to achieve through his/her use of writing skills.

The code *division of labour* is both connected to the decision-making and leadership categories. The division of labour is usually one of the main decisions the group has to make how to split the tasks among the group members. Additionally, the on-line leader usually undertakes the task of the division of labour.

The *choosing a topic* code is the one that links the decision-making procedures with the conflicts one. The choice of a topic is one of the decision needs to be made by the group participants. However, the choice of the topic can easily lead into conflicts.

The *final decision-making* code links the decision-making category to the leadership one. In cases of urgent decision need to be made along with final ones it is the leader that is going to handle such a task.

On the other hand, the *decision-making* is connected to the conflicts, as the conflicts can be one of the consequences of the decision-making procedures.

A number of common codes link the participation category to the other categories. It also seems that the participation category connects to the others through the intervening conditions. Initially, the code of typing skills appears in both participation and leadership categories. The typing skills are considered to be an intervening condition in a group member's participation in the group. They were also taken into consideration as an intervening condition in the leadership category.

The codes *familiarity with computers* and *familiarity with the subject* are appearing in participation and leadership categories as intervening conditions. More specifically the *familiarity with computers* code also connects to the conflicts category.

On the other hand, *familiarity with the subject* code was also linked with the participation and leadership categories but is also linked with the decision-making and the conflicts one. It seems that in cases of decision-making the group participants with the most familiarity with the subject should be the ones who would need to compromise to avoid conflicts.

Participation also connects to the leadership code in two more ways. It seems that the person with *most contribution* in the group is possibly the candidate for taking up the leadership role. In other words, most contribution in the group by a certain group participants is one of the conditions that would lead into the leader's emergence in the group. On the other hand, equal and *even contribution* (participation) in the group is a condition affecting the no need for a leader in the group.

The codes of participation and conflicts are also connected. It seems that *lack of participation* in the group would be one the usual causes of conflicts. The code named level of interest also connects the two categories. The level of interest is one of the intervening conditions in the participation code. On the other hand, the level of interest is a condition in the conflicts category. Depending the group participants' level of interest for the group the peers would be prepared or not to "fight" for their views.

The conflicts category is connected to the leadership one as well. In cases of conflicts among the group members it is the leader that would intervene the most of the times to *solve a possible disagreement*.

One of the most important codes appearing repetitively in the data was the concept of time. For instance, *time management* was a task undertaken by the leader in the group. It was also found that there was a high demand for assigning a leader in order to save time in the group. There were also a number of other codes and categories connected to the code of time, mainly proven to be *time-consuming* procedures. For instance, the division of labour, the explanations and clarifications needed to be given and linked with the expression category

were taking up quite a long time to be applied. Additionally, the slow typists connected to the participation category were losing lots of time especially during the synchronous interaction. Finally, the reaching consensus procedure in the decision-making was also proven to be time-consuming.

The code-named *work-oriented* appeared under the code of politeness in the expression category and also as a reason why there were no conflicts in the on-line group interaction. It seems that group participants felt that they had to be polite in their interaction because they considered the interactions work, without allowing social contacts among the group participants. On the other hand, the fact this was the reason why there were no conflicts among the group members.

In connection to the previous code there is the code named *working versus educational environment* where we included all the quotations where the interviewees have talked about their reactions when being in an educational environment in comparison to a working one. The code is connected to the code named *leadership negative need* as a cause. The interviewees seemed to have said that one of the reasons there was not a need for a leader in the on-line group dealt with the fact that there were working in educational settings, therefore they had to learn and experiment through learning. The code is also a condition for conflicts.

The code *compromising* was found under the categories of conflicts, decision-making and leadership.

The code *group size* was found in connection to the locus of control, as group members found it difficult to control oversized groups. Also the decision-making procedure was found to be more difficult with big groups. Participation in the group was also difficult if the group numbers more than six members. Group size was also a condition in the negative leadership need.

*Group attendance* was found to be connected to the decision-making and also to the participation category leading into either enhanced or unequal participation depending on the level of attendance.

The code named *level of interest* is also linked to the participation and conflicts categories. Firstly, group members will participate in the group depending on the level of interest, if they do not show a great interest for the group then their participation would be minimised. The code is also connected to the conflicts category in the sense that if the group members do not have an interest for the group then they are not willing to strongly support their points of view, therefore no conflicts are happening.

## 10.3 STORY LINE

The main story relates to the way group participants interacted with each other in computer conferencing. *The fact that group participants worked and acted in a computer conferencing environment changed dramatically the way they expressed themselves. Expression in the computer conferencing environment was immediately affected by the lack of social and communication cues, due to the existence of the on-line environment.* Group participants were given the opportunity to keep a record of their on-line activities, have the time to reflect and edit their contributions, and visualise their thoughts. The environment also helped reduce interruptions made by more dominant group participants. Group participants expressed themselves in a more free and careless manner, trying at the same time to be careful and precise, clear of what they were saying, not particularly concerned with politeness and socialising, attempting to avoid misinterpretation and ambiguity caused by the lack of communication cues. Additionally, written communication could lead to careless and offensive behaviour, known as flaming, and could also be restricted by problems of technical nature causing chaotic communication. Eventually, on-line group communication, based on a number of conditions, could lead to the establishment of sense making or agreement or disagreement.

*The way group participants expressed themselves affected the way they participated in the group.* Feeling more free and confident of expressing themselves on-line, group participants, the shy on-line in particular, managed to assure equal participation. They assessed their peers' contributions based on both quality and quantity of inputs, showing a preference for quality instead of quantity inputs. The existence or absence of certain conditions such as computer literacy, familiarity with the software and the subject under investigation, typing skills, group size, level of interest and group attendance affected the on-line group participation processes. Additionally, technical problems inconvenienced and disturbed group participants who sometimes did not manage to maintain control over the environment or over their peers. Gender did not affect the on-line interaction resulting in equal participation. Furthermore, personality influence was diminished on-line as shy students, helped by the lack of direct contact and by diminished interruptions by dominant participants, felt confident enough to contribute in the on-line group and therefore assured themselves of an equal participation. On the other hand, expression of dominance on-line was maintained through the use of a number of intervening conditions such as *Typing Skills*, *Writing Skills*, and *quantity* of inputs. In cases when group participants had to handle non-participation, mainly caused by computer fear, they attempted to solve such problems by discussion, by asking the leader's intervention, by having conflicts, or by meeting face-to-face. If none of these worked they felt obliged to put in extra work in order to compensate for the missing contribution.

*The on-line group interaction represented in the data by the way group participants expressed themselves and therefore participate more, led to two outcomes. Group participants managed to proceed with decision-making resulting in consensus or their interaction could lead to conflict.*

Group participants identified three different types of decisions needed to be made namely the *choice of the topic* under investigation, the *content* of the final group product and the *division of the tasks*. During the *Division of Labour* they followed three patterns in dividing the tasks among them, working together as a *group*, *individually* or using a *rotation* system allowing the handling of overlapping tasks. The division of labour was also handled by the leader or by having face-to-face meetings when needed to assure everyone's participation. If the division of tasks was set correctly conflicts would be avoided. A number of conditions were identified intervening with the decision-making procedure such as *group size*, *course design*, *group attendance* and *deadlines*. Students shown a preference for group orientated decision-making based on discussion or they employed face-to-face meetings when needed, as reaching consensus was time consuming and the identification and appreciation of an overall picture was difficult on-line. The decision-making procedure led to *consensus*, *compromise*, or *arguments*.

Interaction in the on-line group also led to conflict. Students were more inclined to disagree with their peers and support their arguments when on-line, due to the lack of social and communication cues, although no major instances of conflict were reported. Causes of on-line arguments were misunderstandings caused by the misinterpretation of someone's words, decisions needing to be made on the task group members had to carry out, and division of labour. The equal proportion of tasks, the level of interest shown by group participants, group composition, the fact that the on-line environment was considered to be a working rather a social space, and the lack of visual contact were convicted as factors militating for lack of conflicts during the on-line group interaction. On the other hand, the marking system, the closeness of the submission deadline and the fact that the group members acted in an academic not a working environment could result in conflict. However, group participants managed to solve conflict by discussion, by careful use of their words, by face-to-face meetings, and finally by asking for the leader's intervention. On-line group conflict could result in consensus, compromising or occasionally flaming.

*A leader who handled certain tasks within the group facilitated the on-line group interaction. The necessities of Time Management and Organisation in the group helped in the realisation of the need of the leader's creation. On the other hand, the existence of a co-operative group, group members' experience of group working, even contributions, group size, task complexity and learning by experimenting were conditions that when met there militated against the need*

for creating a leader. Some group participants, having experience from previous group situations, volunteered to take up the leadership role expressing their need to maintain control over the group and prevent time waste. Other participants however declined to take control over the group due to extra work and to difficulty in motivating group participants in an on-line environment. Group members who considered themselves "shy" reported not hesitating to take up the leadership role. Reasons explaining such an attitude included the lack of direct interaction and the lack of involvement of physical contact with the group members. Familiarity with computers and the subject the group was dealing with, along with typing skills were reported to help shy group participants take up the leadership role.

A number of intervening conditions facilitating the leader's performance of tasks were identified such as *Familiarity with the Computers*, *Familiarity with the Software* used, *Familiarity with the Subject*, *Typing Skills*, and *Writing Skills*. After the leader emerged in the on-line group through a number of procedures, he/she had to perform a number of duties. The leader's tasks and responsibilities were divided into five main categories namely: *Manage-Organise*, *Inform*, *Decision-Making*, *Time Management* and *Edit*.

The need to have an organising principle was stressed which would be responsible for the *Division of Labour*, the setting of priorities, the assurance that group members handling of equal tasks, the provision of directions when needed, and the information supply. Additionally, the leader was involved in the decision making process, in particular in the final decision-making, and in cases when an urgent decision needed to be made.

Moreover, the leader was responsible for the handling of the editing procedures, initiating, controlling and observing the on-line discussion, preventing interventions, compiling the points of the discussion, checking the content of the given information, putting group members' contributions together and trying to make sense of them, pulling out the irrelevant bits. The final editing of the document including the proof reading, correction of the English language, summarising, confirmation from other group members and the final submission of the group's work, was also performed by the leader. Finally, the leader was responsible for the group's time management, contacting group members and getting all them all together, making timetables, setting deadlines, assuring group members met the group's deadlines, and warning group members when the timetable was not being adhered to. Finally, the leader's emergence and performance of tasks resulted in time saving and better organisation and handling of the on-line group.

The story line is presented in the following Figure 10.1





## 10.4 SUGGESTIONS OF POSSIBLE ELEMENTS OF AN EMERGENT THEORY

It needs to be noticed that the selective coding procedures provided by Strauss and Corbin (1990) have not been followed step by step. Instead of identifying a well-developed core category that would link to all the other categories systematically, the essential cement that linked all categories together was found to be the code *lack of communication cues*. This code and links between it and the other categories were presented in Chapter 9.

The phenomenon under description here is the text-based group interaction. Using now the Paradigm model and trying to place the categories around it, we identified the lack of Communication as the *cause* the links immediately to the Expression code that is considered being the *context*. Participation is the *action* in the phenomenon of group text-based computer conferencing interaction. Expression and Participation could either lead to two different *consequences*, to decision-making (consensus) or to conflict. The on-line interaction was also affected and facilitated by Leadership that was considered to be the *condition*. All the above is presented in the following Figure 10.2

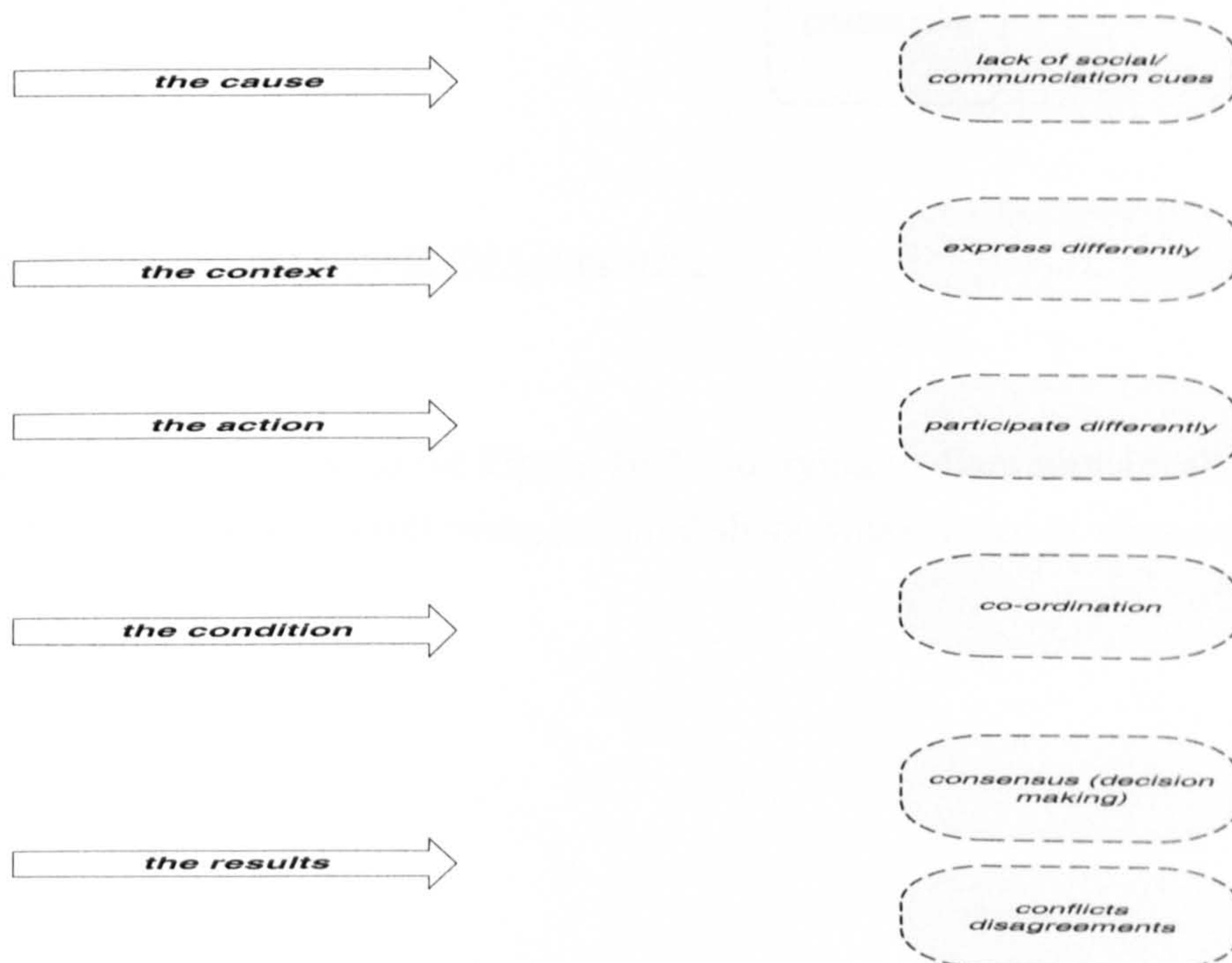
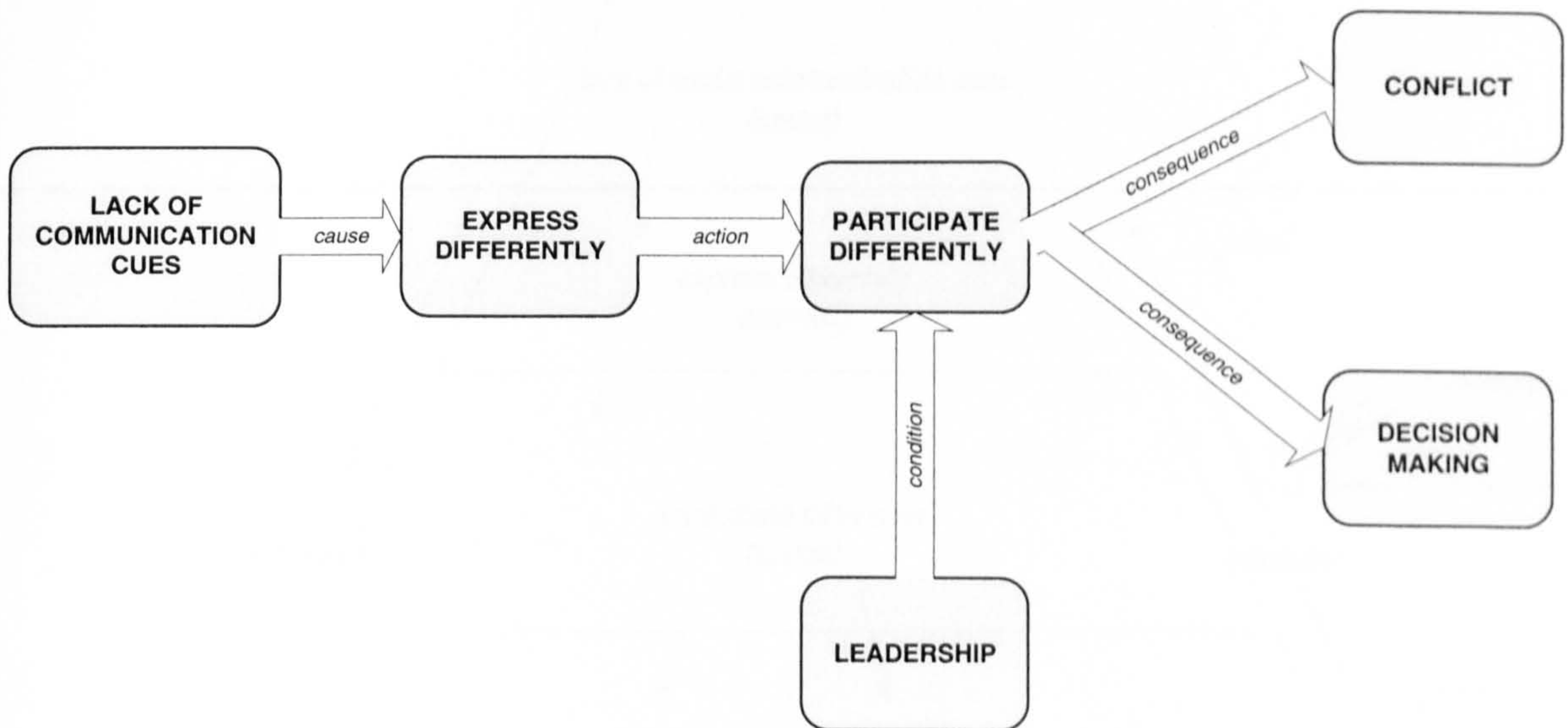


Figure 10.2- Identification of Categories

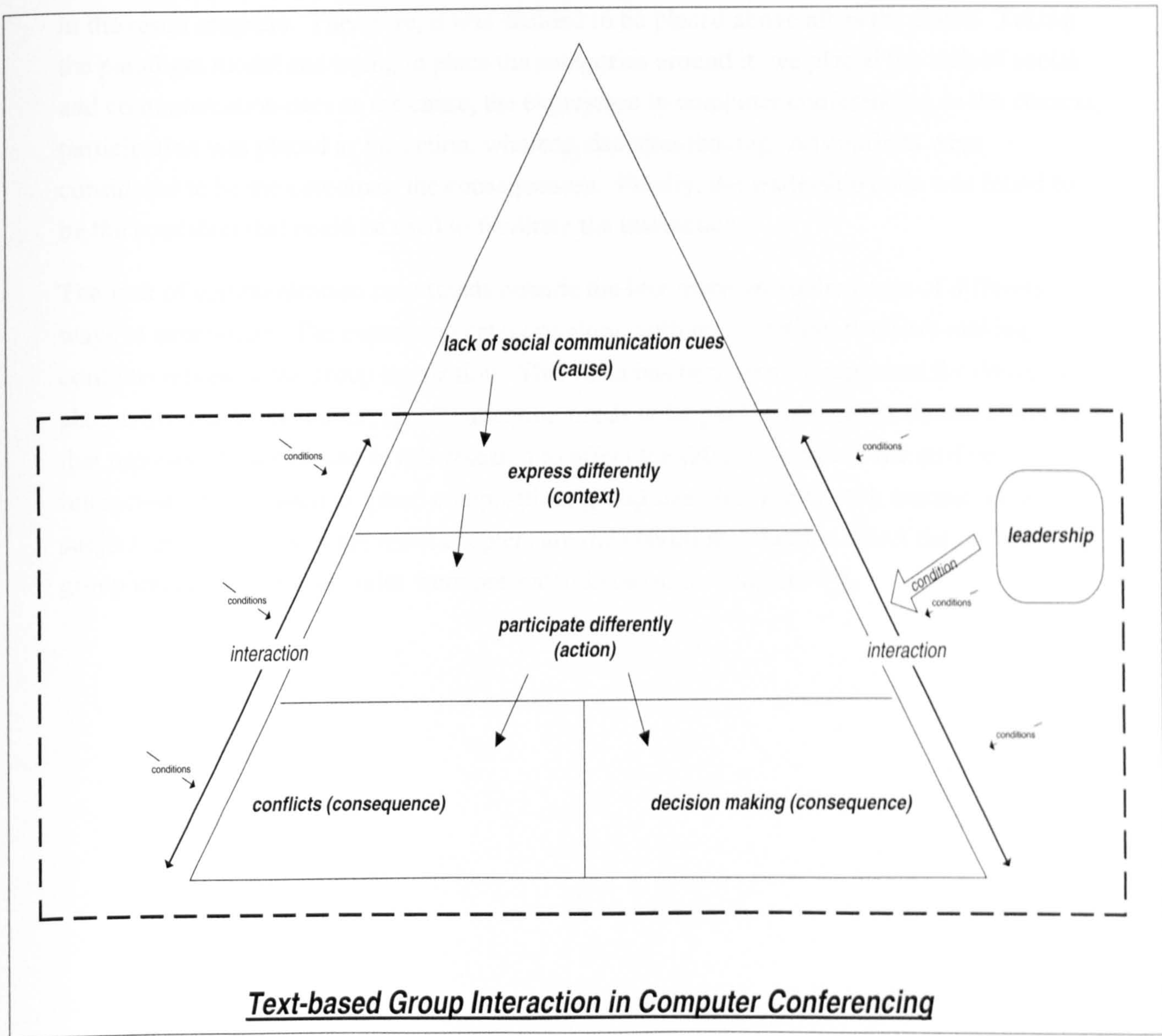
Then linkages among the categories in terms of the paradigm model, can be presented as in the following Figure 10.3.

## TEXT-BASED GROUP INTERACTION



*Figure 10.3- Linkages among the Categories*

Then, using as a base the above Figure 10.3 and trying to diagrammatically represent our data in an abstractive way, the following pyramid shape was created as shown in Figure 10.4



**CONDITIONS:**

writing skills, familiarity with computers, familiarity with the software, familiarity with the subject, group size, level of interest, group attendance, group composition, typing skills, technical problems, course design, deadlines (time), division of labour, marking system, educational environment (experiential learning), existence of co-operative group, complexity of task, tendency to organise, tendency to take control, time saving, expression of different views, choice of topic, misinterpretation, work orientated environment

*Figure 10.4- Text-based Group Interaction in Computer Conferencing*

As shown above the lack of social and communication cues relates to all categories presented in the result chapters. Therefore, it was decided to be placed above all as the cause. Taking the paradigm model and trying to place the categories around it, we placed the lack of social and communication cues as the cause, the expression in computer conferencing as the context, participation was placed as the action, whereas, decision-making and conflicts were considered to be the outcomes, the consequences. Finally, the leadership code was found to be the condition that could be used to facilitate the interaction.

The lack of communication cues stands outside the box represented the cause of different ways of expression. The expression category along with participation, decision-making and conflicts represent the group interaction. This form has been used to represent the data in an abstractive mode. However, special attention needs to be paid in the arrows named conditions that represent factors found in this research to affect the different steps of the on-line interaction. Codes such as group composition, group size, familiarity with computers, the subject, etc, as shown in the result chapters are the conditions found to affect the on-line group interaction. These codes were presented in detail in Chapters 4-8.

## **10.5 POINTS FOR FURTHER RESEARCH**

The present study viewed the phenomenon of on-line group interaction in a holistic view, attempting to identify issues and factors influencing it, with the aim of setting a framework on conditions affecting group dynamics.

However, the present study had certain limitations due to the available sample regarding its "generalisability". The most important ones regard the sample that has been used during the course of the research. The sample was focused on certain academic departments those of Information Studies and Management School at the University of Sheffield in particular. The reason for selecting this sample related mainly to the non-availability of other samples with relevant experience of the topic under investigation. Since the area of research is relatively new not so many people have relevant experience. The topic required theoretical sampling based on the parameter of having experience of group work in on-line group situations.

We cannot claim that the produced elements of group dynamics model could be applied in every student at undergraduate or postgraduate level. Therefore, it would be necessary to investigate the "generalisability" of the model. Ways to carry out further research on the issues identified in the this study include:

The validation of the results and their expansion in other disciplines, provided that appropriate samples could be found. Future research could extend, test and elaborate the applicability of the proposed framework with the conditions affecting it to other disciplines and group of students.

Future studies could also test quantitatively the results of the present qualitative study. It would have been of interest if we could have tested the results in a quantitative mode, by using the same or another sample to do so. However, due to time limitations it was not possible to do this as part of the present study.

Students were arranged into groups by the course leaders, not by themselves. The most common arrangement involved 5 or 6 members in the groups. The fact that students have not chosen their peers may have affected their interaction, as one of the factors presented in the study dealt with the already established relationships in the group.

Future research should also examine differences in users' opinions taking into account conditions like: age, gender, level of study, year of studies, cognitive style, personality etc.

Interviewees reported gender being insignificant in on-line situations. However, at the same time they reported male domination in face-to-face group situations resulting in unequal participation. Therefore, we conceived as relatively important that this matter would need further exploration in future research.

The results of the research indicated that interaction among the group members in computer conferencing depended on attributes of the technology along with other factors. For instance, a number of factors have been identified in connection to equal, enhanced and limited participation.

The code of *Enhanced Participation* appeared to be related to a number of intervening conditions such as *Familiarity with Computers*, *Familiarity with Software*, *Familiarity with the Subject*, *Level of Interest*, *Group Attendance*. Putting the research into another level of analysis (judging by the number of quotations linked to these codes), we could support that a close relation among *Enhanced Participation* and *Familiarity with the Subject* and the *Typing skills* were found. On the other hand, the codes closely connected to *Unequal Participation* were the *Face-to-face Participation* in the group and the *Lack of Familiarity with Computers*, the *Slow Typist* code and *Technical Problems* during the on-line interaction. The relations among these codes would probably need to be further quantitatively explored in future research. Special attention should also be paid in the *Typing Skills* and their affect to participation in the group. Future research should try to validate the connection between those factors and participation.

Research also showed that group participants managed to establish dominance mainly through their typing skills, writing skills and quantity of inputs. Further research should identify additional conditions affecting dominance.

Further research should also investigate in depth the effects of face-to-face meetings in on-line interaction like during decision-making and when problems of non-participation or other serious problems have to be solved.

Research questions should additionally include the following:

- Does complexity of a topic affect preference for face-to-face decision making procedure?
- Are group members capable of dealing with easy decisions on-line?
- Do group members prefer face-to-face interaction in order to deal with more complex tasks?
- Does the marking system affect participation and willingness to come into consensus?
- How deeply do writing skills affect participation, expression and leadership when on-line?

- What are the outcomes of having a leader in on-line interaction?

The results of the study have shown that group participants felt more comfortable disagreeing with their peers when on-line. However, a conflict on-line was never a real conflict as the on-line environment diminished the heat. Therefore, interviewees did not identify major cases of conflict and flaming. The diminished effects of on-line interaction in conflict will need to be investigated further.

As Higher Education institutions develop on-line web-based distance learning environments, educators need to adopt technology and use new educational approaches and students are expected to develop new skills. The finding of the current research, as identified factors and perceptions of on-line group interaction, can be considered and used with their implications in the design and development of Networked Learning Environments. Hence, they can be applicable in terms of tutoring/moderating strategies in the design of instructional systems by higher institution educators.

Different research outcomes can be set as criteria and used as strategies concerning for instance, group formation, group management and moderation.

Course developers and tutors can set of minimum requirements on technology and information handling. They can also plan and provide training in the ICT environment along with training in the different types of CSCL environments in use.

Different backgrounds concerning the use of software and CMC along with prior knowledge, qualifications, work experience need to be taken into consideration. Groups, therefore, can be organised according to different backgrounds and related experience and course developers can organise groups according to similarity of backgrounds or can place group participants with different backgrounds in the same group in order to ensure diversity of opinions. Hence, research results such as familiarity with the software and hardware, familiarity with the subject need to be taken into account.

On the other hand, the research results showed that typing skills played a vital role especially during the use of synchronous modes of on-line communication. Therefore, course developers need to plan and provide typing skills training; try to moderate groups in order to avoid dominance by faster typing students; organise groups according to similarity of typing skill.

Writing skills can also be taken into consideration when using text-based conferencing technologies.



Groups can be moderated in such a manner by the course developers to avoid dominance by students who feel more familiar with the subject;

Groups also be organised in manageable working groups (4-6 students) as group size was found to affect group interaction.

Group participants attendance needs to be encouraged or even enforced as checked by using students tracking systems.

As group composition was found to affect group interaction, course developers need also to take into consideration the already established relationships-if any- among the group members.

Finally, course organisers have to anticipate possible networking, SW and HW problems that might happen during the on-line group interaction. Instructions on possible problems need to be provided (as FAQ) along with technical support throughout the duration of an on-line course.

The role of a possible leader in the group needs to be anticipated and the tasks undertaken by such a person emerging in the group (as depicted in the research findings) can be used in the design of on-line web-based environments.

The design of a web-based course could also involve:

- making group participants aware of the fact they need to be careful of their words, when on-line, in order to prevent misinterpretation and therefore misunderstandings
- being aware of the non-native speaker's use of the English language
- grouping of participants according to their computer literacy, familiarity with the subject, to see if they would make any difference on the group's outcome, or mix group participants based on the above characteristics
- allowing group participants to split themselves into groups
- considering having face-to-face sessions to facilitate decision-making, and division of tasks
- placing group participants in groups according to their typing speed
- providing group participants with technical support to face problems of technical nature
- paying attention the effect of deadlines (i.e. is the procedure of decision-making accelerated when deadlines approach?) and time limits
- paying attention to the group composition, either choosing group members who know each other or not, to identify if it is going to make any difference in their interaction

- defining a leader in the group from its initial stages of interaction, to identify if the existence of a predefined leader would make any difference
- pre-defining the roles of the leader as presented in the study
- placing people into groups based on their familiarity with computers and the topic under investigation
- paying attention to the group size based on interviewees recommendations
- finding ways to assure group member attendance.

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# APPENDICES

# **APPENDIX 1**

## **A SAMPLE OF THE INTERVIEW SCHEDULE**

The following is only a sample of the questions asked during the interviews. As mentioned in the Methodology Chapter, semi-structured interviews were chosen in order to give the flexibility needed to ask questions not in a strict way and to allow following the flow of the interview conversation.

Do you think that on-line environments have a potential for learning?

Do you see any differences between what we call traditional and on-line learning?

What do you think of on-line collaborative learning?

Do you enjoy working on-line with other people in a group? Why?

What about any differences between what we call collaborative learning and individual learning? If you had a chance to do something individually or on your own, what would you prefer to do? Why?

How do feel when you communicate on-line with the your group members?

Do you try to approach your group members in a different manner when on-line?

When you use on-line group environments do you have this feeling of controlling things or do you feel threatened in a way or unconfident?

Do you find that you express yourself in a different manner when you are on-line in comparison to face-to-face? Did you use different ways of expressing yourself when on-line?

Is the lack of visual contact and fact that you remain anonymous making you feel any different when expressing on-line?

Do you think that the language competence affected the way you expressed on-line?

How about when English is not somebody's mother tongue, do you prefer to chat with these people face-to-face or on-line?

What do you perceive as the ideal number of group members on-line?

Do you think that knowing the members of your group makes any difference to the interaction?

Would you prefer to have face-to-face meetings with your peers along with the on-line ones?

Do you perceive the on-line environment as work related?

Was everyone participating in your group?

Were group members participating equally? Did you have any people who participated more than the others? Why?

Do you think that familiarity with computers, the specific software used or the subject made any difference in participation?

Do you think that participation in the group is affected by gender?

Do you think that typing skills have an affect on participation?

Were there any people who did not participate? Why do you think these people did not participate? What did you do when a certain group member did not participate?

What criteria did you use for assessing your peers' participation?

How do you think that we can enhance people's participation in the on-line group?

Did you feel that you needed some guidance in this on-line experience?

Do you believe that there is a need for a leader in the on-line group situation? Did you create some sort of a leader in the on-line group situation?

How did you choose who was going to be the leader?

How did you call this person (leader/co-ordinator/facilitator?)

Was the leader the same every time?

Did you offer yourself to be the leader? Would you personally like to be the leader if you had the chance?

How the leader emerged from the group?

Do you think that group participants reacted positively to the leader's existence in the group?

Did familiarity with computers, the software or the subject made a difference in the leader's emergence?

What sort of qualities you perceive important for the on-line leader?

Can shy people become leaders of the on-line situation?

So, what were the leader's responsibilities and duties in the group?

What about the procedure of the decision-making. Did you have a certain way of acting when you had to make decisions in the group?

What kind of decisions did you have to make in the group?

Did prefer the group to reach consensus?

Were you willing to compromise on certain issues during the interaction?

Who made the final decision?

How did you divide the tasks among the group members?

What if group participants wanted to undertake the same tasks?

Did the leader divide the labour?

Did you have any sort of conflicts/disagreements among the on-line group members?

What were the usual causes of disagreement? Do you find it easy to take another person's perspective when on-line?

Were misunderstanding a usual reason of conflict? What do you think caused the misunderstanding?

Was no participation a reason for a disagreement?

How did you manage to solve the disagreement?

What about the advantages and disadvantages of working on-line in a group?

What about the advantages and disadvantages of working face-to-face in a group?

What if you had to chose to do something on-line or face-to-face?

What were your initial expectations from your on-line group?

Did you find that this on-line group fitted your expectations?

If you had to work in your on-line group again what would you change to make it more successful, or more suitable to your needs?

Is there any final comment that you would like to make, or add?

## APPENDIX 2

### ***Collaborative Learning Tools, Software and Environments***

The aim of this Appendices is to include some of the most commonly used collaborative learning tools and software.

#### **Aspects- Collaborative Writing and Discussion Software**

*"Aspects" is software for collaborative writing, editing and discussion in a Macintosh lab or classroom. It's used in English, writing, foreign language, ESL, and journalism classes at all levels, from elementary school through college. (<http://www.grouplogic.com/aspects/index.html>)*

#### **CLEO (Collaborative Learning Environment On-line)**

*CLEO supports inquiry and collaboration in science and mathematics by publishing classroom investigations on the Web. It promotes the use of real data in the pursuit of research questions by giving students:*

- *tools to share, analyze and discuss results*
- *a library of completed inquiry projects with full documentation*

*Each CLEO project has five components:*

- *a research question that drives the investigation*
- *the procedure and materials used to gather the data*
- *the actual data themselves*
- *an analysis of those data with graphs and charts*
- *a conclusion that leads to new question. (<http://cleo.terc.edu/cleo/cleo-home.cfm>)*

#### **Collaborative Computing Toolkit Series or CCTS**

*DataBeam offers an integrated set of software development tools for implementing multipoint data sharing applications based on the T.120 standards called the T.120 Toolkit Series. This toolkit series, formerly known as the Collaborative Computing Toolkit Series or CCTS, is designed to allow*

*professional software developers to rapidly embed real-time collaboration facilities into new or existing applications. (<http://www.databeam.com/ccts/>)*

## **Commercial Web Conferencing Software and Free Web Conferencing Software**

*A comprehensive guide to software that powers discussions on the Web. (<http://thinkofit.com/webconf/>)*

## **CoVis- Collaboratory Notebook**

*The Collaboratory Notebook is a networked, multimedia tool that supports group work in project science. It provides a single, pedagogically-motivated medium in which students, teachers, and research scientists can collaborate on scientific inquiry across the boundaries of time and space. The software is based on the metaphor of the scientist's laboratory notebook, with a bookshelf, notebooks and pages being the primary interface elements. It extends this metaphor with facilities for collaborators anywhere on the Internet to share and co-author inquiry. (<http://www.covis.nwu.edu/software/>)*

## **GroupSystems (Decision-Support System Software)**

*GroupSystems is a suite of team-based, decision support software tools that shorten the cycle time for strategic planning, product development, problem solving, and other business processes. (<http://www.ventana.com/>)*

## **Delphi Planning System (Consensus- Building Tool)**

*(<http://planet.rtec.org/menu.html>)*

## **Expertchoice**

*Read about Expert Choice in the educational community in an article entitled "The Teachers' Forum: Breaking the Mold -- A New Approach to Teaching the First MBA Course in Management Science" by Matthew J. Liberatore and Robert L. Nydick. In this article they describe how Villanova University incorporated Expert Choice into their MBA course "Decision technology for business application (DT)" for decision analysis, as well as several examples of how the students applied the software. (<http://www.expertchoice.com/>)*



## **Facilitate.com**

*Facilitate.com provides your organisation with a powerful set of conferencing tools. Your employees, clients and team members work together in the same room or join in from across the Internet to exchange ideas, solve problems and create new opportunities. All they need to participate is a standard web browser. (<http://www.facilitate.com/>)*

## **First Class**

*FirstClass is a multi-platform (Windows NT and Macintosh) communications server that's easy to use and administer. It integrates the power and versatility of email and conferencing with Intranet and Web publishing. And FirstClass Gold has powerful new features to make communication, collaboration and time management simpler and easier than ever before. (<http://www.softarc.com/homepage.shtml>)*

## **Lotus Notes**

Lotus Notes R5 is state-of-the-art e-mail, calendaring, group scheduling, Web access and information management -- all integrated in an easy-to-use and customizable environment. (<http://www.lotus.com/home.nsf/welcome/lotusnotes>)

## **MeetingWorks**

*MeetingWorks` the premier collaboration support software, automated tools and structured processes that dramatically improve group work processes, decision making, and time-to-result. (<http://www.entsol.com/index.html>)*

## **MUDs and MOOs**

*The is a big number of MOOs or MUDs worldwide. They are Multiple User Dimension, Multiple User Dungeon, or Multiple User Dialogue) is a computer program which users can log into and explore. (<http://www.cs.cf.ac.uk:8008/User/Andrew.Wilson/VR/sites.html>)*

## **Testbed for Telecollaboration, Alice Software**

*The Alice Software is key to the Testbed's networked-inquiry model. TERC developed Alice to provide students and educators with easy-to-use, integrated tools that include a word processor, data table, graphing and mapping utilities, and telecommunications. The Alice Software currently comes in two varieties: Alice Data Tools Software, and Alice Network Software. These two versions are very similar; however the Alice Data Tools Software has all telecommunications functions disabled and is generally used only in conjunction with Web browsers as a helper application for data analysis. (<http://teaparty.terc.edu/tech/alice/alice.html>)*

## **Virtual U**

*Virtual U is an exciting TeleLearning NCE state-of-the-art technology for online course delivery. It is easy to use and meticulously planned to scaffold knowledge building and collaboration. Virtual-U is being tested in many institutions across Canada and abroad, involving over 150 instructors. More than 230 courses from over 30 disciplines of all fields of knowledge have already been delivered using the software. The Virtual-U trials represent the largest field research on online educational delivery systems in the world and are generating powerful data on instructional designs, impact on instructor and learner workload, satisfaction and practice, quality of learning, assessment issues and drop-out rates. Virtual-U is also building communities of practice, linking instructors around the world who are committed to advancing telelearning research and applications. Through such field trials, we are demonstrating in Canadian organizations and in other countries that network learning does work. Just as importantly, we are identifying shortcomings in commercial technologies, teacher and faculty training, and institutional policies. Research findings related to progress in assessment and cost benefit analysis will provide significant guidance to the design and implementation of effective telelearning models. (<http://virtual-u.cs.sfu.ca/vuweb/VUenglish/>)*

## **WebGrid II**

*WebGrid II is an implementation for the World Wide Web of George Kelly's repertory grid technique for building conceptual models based on his Personal Construct Psychology (PCP). WebGrid asks you to define a domain of interest, a context or purpose, and some elements or entities that are part of the domain and relevant to your purpose. It then elicits constructs from you, which establish how you distinguish the elements in your domain in ways that are relevant to your purpose. WebGrid provides a variety of methods for modeling and visualizing the relations between your constructs. It also enables you to compare your constructs with those of other people. Facilities are also included for using your conceptual model as an expert system. (<http://tiger.cpsc.ucalgary.ca/WebGrid/WebGrid.html>)*

[All the above URLs have been last assessed on the 9/12/1999]