THE PROCESS OF LEARNING AND TEACHING IN SUPPLEMENTAL

INSTRUCTION GROUPS AT RHODES UNIVERSITY

THESIS

Submitted in fulfilment

of the requirements of the degree of

MASTER OF ARTS

of Rhodes University

by

JO-ANNE ELIZABETH VORSTER

June 1999

Abstract

This thesis investigates the process of peer collaborative learning in three Supplemental Instruction (SI) groups at Rhodes University. The roles of the SI leader, the students and the task in the peer-collaborative learning-teaching process were researched.

The research is rooted in sociocultural theories of learning and development. The notion of activity is thus central to this investigation. The tasks, goals and interactions in the SI sessions were analysed in order to arrive at an understanding of the process of learning-teaching in each of the three SI sessions. A method of analysis devised by Van Vlaenderen to study the process of everyday cognition in the problem solving activities of community activists (1997) was adapted for this study. The method of analysis was used to study the interaction processes of participants in the SI groups. Each interaction between the SI participants was broken into its constituent parts and labeled in terms of the goals of the interactions in relation to the preceding interaction or operation, the task or subtask under discussion, and the SI session as a whole.

Data from the analysis of the activity were quantified in order to assess the quality of the learning-teaching process. A qualitative analysis of the patterns of mediation was used in conjunction with the quantified data of interaction patterns to draw conclusions about the nature of the peer collaborative learning-teaching process in the three SI sessions.

The research findings indicate that the nature of the SI task is crucial; students in SI need to be able and willing to participate; and the facilitation style of the SI leader plays a role in determining the quality of the activity in the SI session. The thesis explicates learning-teaching activity that results in higher order learning.

Table of Contents

List of Tables

List of figures

Acknowledgements

I sincerely thank the following people for their contribution to this thesis:

My supervisor, Prof. Andy Gilbert, for his support throughout this project, and for the meticulous and challenging way in which he commented on drafts of this work.

My colleagues in the Academic Development Centre at Rhodes University - Arona Dison, Lynn Quinn, Thami Tisani, Rose Nelson, Chrissie Boughey and Markus Mostert for unfailing moral support; Arona and Lynn for responding to drafts of the thesis and proofreading; Saynile Malinga for all her patience.

Bessie Chiota for acting as independent coder.

Ntombekhaya Tisani for her patience. I know it was not easy and that she would rather not have known as much about spreadsheets as she now does; Mike Swift for data capturing and work on the spreadsheets; Hetal Patel for checking my calculations and Nadine Cloete, Matthew Charlesworth, Karin Everett and especially Markus Mostert for helping to sort out my word processing problems.

The SI leaders and students who allowed me to use their work for my research.

My son, Daniel, who had to spend many hours without a mother and who urged me many a time to "cancel" the thesis. I hope it was worth it.

My husband, Anton, especially for his help during the final stages of preparing this manuscript.

--------ooooo--------

This thesis is dedicated to my parents, Elizabeth and Joseph Jasson, with love, appreciation and much pride.

CHAPTER ONE

THE SCOPE AND CONTEXT OF THE RESEARCH

1. Introduction

This research is located within the fields of Cognitive Psychology and Academic Development (AD). In this introductory chapter I shall outline the theoretical perspectives that underpin this research in relation to the two fields. Academic Development is the umbrella discipline for the study. The process of collaborative learning is examined in relation to the cognitive development of students which, in turn, is considered as part of the broader notion of AD.

The aim of this research is to investigate the process of peer collaborative learning in Supplemental Instruction (SI) groups in two first year university courses. Most of the research on peer collaborative learning has taken place in schools and has focused on a comparison between traditional competitive learning and a collaborative learning milieu (Cohen, 1994, Johnson & Johnson, 1985, 1991; Slavin, 1980). The research on SI has concentrated on comparisons between the academic performance of SI attendees and non-attendees.

This research investigates the process of peer collaborative learning in SI groups rather than the performance outcomes of students who participate in the collaborative learning process. The following research questions were thus asked:

- What is the nature of the interactive process between the SI leader (SIL) and the first year students?

- How are the learning tasks negotiated, that is, how do the SIL and students reach task definition and intersubjectivity?

- What is the nature of the tasks the group engages in?

- To what extent do the interactions and the tasks present opportunities for knowledge restructuring and critical thinking?

The research findings centre on the roles played by the SI leader, the students and tasks in SI.

2. The context of the research

The research took place against the backdrop of momentous changes in education in South Africa in the last three years of the 1990s. Education, *per se*, is a contested arena. Brookfield says: "Classrooms are not limpid, tranquil ponds, cut off from the river of social, cultural, and political life. These are contested spaces – whirlpools containing the crosscurrents of struggles of material superiority and ideological legitimacy which exist in the outside world.' (1995, p.3).   As a result of the socio-political history of education in South Africa, education has been even more contested than it would have been in a "normal" society. The Apartheid school system has left some students underprepared for university studies.

Since the 1980s various academic support programmes were initiated at universities in an attempt to help academically underprepared students cope with mainstream teaching and learning activities. However, many of these programmes attempted to teach academic skills disembedded from the curriculum content the students were studying.   These programmes specifically targeted students from disadvantaged educational backgrounds, and as such branded students as different to the majority of the students on the campus.   These remedial

programmes did not have the support of the students they were meant for and research seemed to indicate that skills were best developed as part of a systematic programme, integrated into the first year curriculum (Drewett, 1993; Zuber-Skerrit, 1987).

Supplemental Instruction (SI) was developed at the University of Missouri, Kansas City (UMKC), in the late 1970s in order to provide a non-remedial vehicle for the development of skills and content knowledge in historically difficult university courses. Tertiary institutions in the United States of America and elsewhere, have been experiencing the growth of heterogeneous student bodies as a result of "the democratization of, and open access to, tertiary education since the 1960s" (Zuber-Skerrit, 1987). The UMKC response was unique in that it targeted courses rather than students. It also required much more active involvement from the participants than other forms of tutor-directed programmes.

The fact that SI requires students to be active agents in their own learning, is shown by this research, to offer challenges to SI leaders and groups. The effectiveness of the peer collaborative learning experience is seriously undermined if participant activity in the teaching-learning process is limited. Factors that limit the active, collaborative involvement of students and thus the effectiveness of SI were isolated by this study.

The SI groups who were the subjects of this study come from Rhodes University, South Africa. Rhodes University is an English university with a liberal history. Judging from the University's student intake, its niche market seems to be middle-class, academically well prepared students. However, a small percentage of students who do not achieve the university's automatic entrance requirements, but who are deemed to have academic potential

by the deans of faculties gain access to the institution each year. Thus the student population

is made up of so-called prepared and underprepared students.

2.1 Academic Development

The field of AD has evolved from being a marginal endeavour in traditionally white universities, where academic support tutors were employed to help underprepared black students cope with the demands of university studies, to a mainstream enterprise that initiates and supports changes within institutions so that teaching and learning is improved for all students. During the 1980s it has become increasingly clear that the "problem" of students being underprepared for university was no longer an issue that pertained to a minority of black students on traditionally white campuses. Many students are now perceived as underprepared for the demands of university study. One reason is that school study is very different from university study and as such makes different demands on students. Another reason is that the demographics of tertiary institutions are changing. They are becoming increasingly heterogeneous and diverse in relation to their racial composition, the home language students speak and the educational experiences students bring to the institutions.

 When universities were small, elite institutions, lecturers were able to spend time with students inducting them into the culture of the universities, either in individual or small group tutorials. With ever-larger numbers of students from all backgrounds gaining access to tertiary studies, this kind of enculturation is much more difficult to achieve.

Academic Development is concerned with finding ways in which the enculturation into the literacies of academic disciplines can be made accessible to all students. Thus there has been a realization that it is not a small group of students who have to adapt to the changes in tertiary education, but rather that institutions have to change so that they can better serve all their students.

2.2 Cognition as a socially situated process

This research is informed by the widespread recognition among sociocultural theorists that learning and development are mediated in many different ways (Griffin & Cole, 1984; Lave, 1991, 1993; Rogoff, 1995). It is understood that learning is mediated by significant others who help learners to acquire the literacies that will enable them to become part of the disciplines they wish to access. Learning is essentially seen as a social process that cannot be divorced from the social context. It is further recognised that learning occurs through participation in culturally situated activities with other members of the community. SI is one way in which students are encouraged to participate in the cultural activities of the academy.

3. Supplemental Instruction (SI)

This belief underpins the practice of Supplemental Instruction (SI). SI is a peer collaborative academic assistance programme where successful senior students who have been trained in basic learning theories and strategies for mediating active learning, facilitate learning for small groups of first year students in out-of-class, voluntary sessions. The SI leader (SIL) is the more-competent other (Vygotsky, 1978) who mediates learning for the SI group through

using her knowledge of the content area and SI facilitation strategies. In SI sessions students engage with the SIL and each other in an attempt to better understand the course material and to develop ways in which to learn the material. SI is thus one way to facilitate the academic development of first year students at university.

The findings of this research seem to indicate that SI is successful in mediating learning for students who are able and willing to participate in the teaching-learning process. Students with a poor academic background and who are not used to the interactive nature of the peer collaborative structure do not seem to benefit to the same extent as their more prepared fellow students. Clark (1998) and Koch & Mallon (1998) found that underprepared students seem to prefer a more structured approach than is traditionally offered by SI. Hunt (1997), in her study of tutorial groups at Rhodes University, indicated that the teaching-learning process in tutorial groups that depend for its effectiveness on student interaction, was not as effective with second language students from former DET (Department of Education and Training) school backgrounds. My research indicates that a successful SI session requires students to share responsibility for the process with the SIL. The SIL, in turn, needs to be able and willing to share the responsibility with the group. Not all leaders and students are able to rise to the challenge.

3.1 Supplemental Instruction and Academic Development

As the second millennium comes to a close, AD is instrumental in the move in education towards Quality Assurance (RSA, 1995). Essentially, Quality Assurance has to do with accountability. Academic institutions are accountable to their students and their many other

stakeholders to ensure that students engage in quality learning through the quality of the institution's curricula, including teaching and assessment practices.

Thus, even though this research was started at a time before the Quality Assurance movement came into fruition, it now needs to take cognizance of the new developments and assess how SI fits into the notion of assuring a quality learning experience for students. I hope to be able to show how the findings of this research may be applicable in helping institutions assure quality for their students.

4. The structure of the thesis

In the theoretical overview (Chapter Two) I position teaching and learning as a socially constructed process. Teaching and learning takes place within a context where participation in cultural activities brings about learning and development through a process of mediation. An overview of some of the main theories that underpin thinking about the cognitive development process of university students is presented. Finally, the notion of underpreparedness is examined. Collaborative learning is posited as one way in which the learning needs of diverse students may be mediated.

In Chapter Three various theories on collaborative learning are discussed. Collaborative learning is seen as a way to build learning communities (Treisman, 1986, Bruffee, 1993). Research on the conditions for effective collaborative learning is explored. Supplemental Instruction is situated within the collaborative learning framework. An argument for the position of this research project within the area of collaborative learning is made.

Chapter Four outlines the aims of the research and explains the research orientation followed in this study. The meta-theoretical framework for this research is socio-cultural theories of development. As this research is concerned with examining process, a qualitative research methodology is followed. The research methods are outlined. An innovative research method developed by Van Vlaenderen (1997) is employed to analyse the interaction processes in the SI groups. The research data on the interaction patterns is presented in Chapter Five. In Chapter Six data related to the mediation patterns is presented.

Chapter Seven provides a discussion of the research findings of this study. The study found that the factors that influence the quality of learning-teaching in SI groups include the nature of the tasks, the way the activities are mediated by the SIL and the contributions made by the students in the teaching-learning process.

The thesis concludes with Chapter Eight. In this chapter I consider the shortcomings of this research and make recommendations for further research. I also outline some recommendations for assuring quality practice in teaching and learning that emanate from this study.

CHAPTER TWO

THEORETICAL PERSPECTIVES

1. Introduction

This research is grounded within a sociocultural paradigm of learning and knowledge construction. "The goal of a sociocultural approach is to explicate the relationship between human action, on the one hand, and the cultural, institutional, and historical situations in which action occurs, on the other" (Wertsch, Del Río and Alvarez, 1995, p. 10). The focus of this study is the processes of interaction between students as they engage in peer learning groups within the context of a traditionally English South African university in the late 1990s.

The students who participate in these learning groups come from diverse language, cultural, socio-economic and educational backgrounds. However, the teaching and learning process often assumes a homogenous group of learners (Lave, 1993). Thus, in many instances, it does not take account of the various and varied assumptions, goals and sociocultural histories of students. A sociocultural approach begs that the above-mentioned factors relating to student profile be taken into account so that learning opportunities devised by university teachers may facilitate the cognitive development of all the students who engage in them.

A number of academic development (AD) practitioners have been influenced by the sociocultural approach to the development of mind (Dison, 1997). These sociocultural theories articulate well with the conceptions of teaching, learning and knowledge construction to which many AD practitioners subscribe. Boughey (1994), working in the field of academic

literacy and writing development in South Africa, for example, recognises that not all students' prior learning experiences prepare them for the type of learning required by universities. She believes that university writing tasks are tools through which students can learn to develop academic literacy so that their writing becomes appropriate for the sociocultural setting of academia. I shall discuss aspects of academic literacy under a separate heading later in this chapter.

2. The sociocultural genesis of knowledge

Sociocultural psychologists see cognitive development as a generative process, which takes place as a function of social interactions. Learning is a social activity that takes place within a specific social context. Rogoff (1995, p.141) asserts that individual development should be studied in terms of its interrelation with social interaction and the cultural activity which is the focus of personal and interpersonal actions. The social setting, the individuals involved in the action and the activities which they participate in are all interrelated within the teaching and learning process. Vygotsky's term for the process of teaching and learning, i.e. teaching-learning, (1978) takes cognisance of the reciprocal nature of the roles of teaching and learning. It is descriptive of the active involvement required from both participants in the teaching and learning relationship. I shall thus refer to the process within which teacher and learners are engaged in, as teaching-learning or learning-teaching interchangeably.

2.1 The role of activity

In a discussion of Leont'ev's notions of action and activity, Bronckart (1995) states that "the notion of activity concerns the most general forms of the functional organization of behaviour, through which members of a species gain access to the world" (p.76). He further says that "activity develops through actions; it breaks down into substructures of behaviour oriented toward *goals* and is underpinned by the group's *usage of rules*" (p.76, original emphasis). Schools and universities are cultural environments. They exist for the purpose of organising activities, which enable the cultural knowledge of previous generations of scholars to be passed on to, and built on by, later generations. Another primary goal of schools and universities is the construction and dissemination of new knowledge. The specific usage of rules, which denotes that individuals have accessed the world of academia, is gained through engagement in the various activities of learning and teaching within the university. A discussion of the activities and goals, which the community-of-scholars values, will follow in the section on academic literacy below.

For Rogoff (1995) the use of "activity or event" as a unit of analysis which takes account of "active and dynamic contributions from individuals, their social partners, and historical traditions and materials and their transformations" (p.40) offers sociocultural researchers opportunities to observe and understand learning and development within a given sociocultural sphere. Activity as a unit of analysis preserves the interrelation of individual and social context. Rogoff notes that an approach that preserves the unity between actor and context addresses Vygotsky's view that the essence of an event should not be lost through

focusing on discrete elements which would lose their meaning if studied without reference to the sociocultural context.

The social setting, the individuals involved in the action and the activities which they produce are all interrelated within the teaching-learning process. Activities and the context within which learning happens are integral to knowledge production. According to Brown, Collins & Duguid (1989, pp. 32-33) understanding is developed through authentic activities in "situational use". They define authentic activities as "the ordinary activities of the culture" (p. 34). Within the university context these would include lectures, tutorials, essays, exercises, field trips and practicals whose aim it would be to initiate students into the "world" of psychologists, lawyers, sociologists, and so on.

According to Perkins, Jay & Tishman (1993) the process of enculturation through which students become part of new knowledge communities involves:

- Cultural *exemplars* that can be artefacts and people who model or otherwise exemplify cultural knowledge;

- Direct *transmission* of key information; straightforward teaching of concepts, vocabularies, and information related to cultural knowledge;

- Involvement in cultural *activities* that entails hands-on practice in using aspects of cultural knowledge; and

- Involvement in cultural *interactions* where interpersonal exchange of cultural knowledge takes place between learner and learner and between learner and mentor (original emphasis, pp. 79-80).

The sociocultural activities in which experts and novices are involved, make learning possible. According to Vygotsky (1978) children learn through their interaction with more experienced members of a community. Tharp (1997) and Newman, Griffin & Cole (1989) believe that joint productive activity between experts and novices towards a common purpose, which affords participants opportunities to talk about the shared activity, is an ideal way to learn. "Even the youngest children, as well as mature adults, develop their competencies in the context of such joint activity" (Tharp, 1997, p.6).

2.1.1   Mediation

During joint productive or goal-directed activity (Pascual-Leone, 1995) cultural knowledge is passed on through a process known as mediation. Mediation is made possible through the use of signs and tools or through engagement in cultural activities with significant others. Language is an example of a sign system through which cultural ideas and mental processes (thinking) are mediated. The mediation process assumes a link between social communicative processes and individual psychological processes (Wertsch, 1991).

Knowledge is socially constructed and learning develops as a result of dialogical and dialectical interactions between teachers and learners and between two or more learners. According to Vygotsky learning takes place on two planes. First on an inter-mental plane, i.e. between people, in activity of which conversation is one type, and later on the intra-mental plane, i.e. within the learner's mind. On the inter-mental plane the learning process is mediated by others. The learner develops ideas and thinking patterns through her interactions with significant others. On the intra-mental plane, a dialectical process between old and new

conceptions occurs within the learner's mind. She practices and repeats that thinking until the new thinking becomes internalised (Vygotsky, 1978).

Through conversations with more mature members of a culture, learners come to know the meanings of words and concepts. Thus they come to share these meanings with the rest of the mature members of the culture. Humans have developed tools for mediation. These may be concrete tools or artefacts like computers or psychological tools like language which are used to mediate ideas.

For Miller (1989) mediation and the mediator are central to the learning process. Miller states that "the source of the action lies not in the person who acts, that is the biological constitution of the actor, but in another person who instructs and regulates the action" (Miller, p.156). The fact that human actions are regulated by others allows learning to take place. Learning is not the mere transfer of knowledge and understanding from one person to another; rather it has to do with actions which are regulated or mediated in ways which "enable the learner to construct understanding" (Miller, p.156).

Through mediation a learner develops actions which help her to understand problems or regulate her actions in a particular way. This external regulation enables her later to regulate her own actions, mental or physical, to solve problems of the same kind (Miller, 1989). This regulation of action which first takes pace on the inter-mental plane can take place later on the intra-mental plane.

Mediation can be horizontal, that is, between learners of the same age or it can be vertical, where experts induct novices into cultural practices. Each type of mediation offers a qualitatively different path through which the world can be accessed (Topping, 1997). For example, mediation by peers allows for the potential development of cognitive conflict, which can precipitate learning without purposeful structuring of goal directed activity. Vertical mediation, on the other hand, is often structured and directed towards specific teaching goals or learning outcomes. What Vygotsky calls the *zone of proximal development* denotes a psychological "space" where mediation of knowledge can effectively happen.

2.1.2 The Zone of Proximal Development

In this section I shall discuss the role of the *zone of proximal development* (ZPD) in the process of mediation. Vygotksy proposes that learners have an actual level of development which can be assessed through various tests, as well as a potential level of development which they can reach while they engage in problem solving activities of "instructional social interaction" (Rogoff & Wertsch, 1984, p.2). Vygotsky defined the ZPD as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p.86). Rogoff & Wertsch (1984) call the ZPD "a dynamic region of sensitivity in which cognitive development advances"(p.1). In this dissertation the ZPD is understood to be a "zone" within which the learner is ready to learn or develop when the activity challenges her to do so.

For Vygotsky, instruction precedes development; learning is thus the precursor to cognitive change and development and occurs within the ZPD. If the distance between actual and potential development with the help of mediation is negligible, there is no need or motivation to learn. Also, if the gap between the known and the unknown is too big, learning mediation can not take place either. A person will learn from interactions that are structured at the appropriate level. Initially, Vygotsky asserts that the new cognitive processes the learner acquires through the process of instruction are exercised only in interaction with adults or peers. These processes then become internalised and become part of the learner herself (Rogoff & Wertsch, 1994).

Wertsch (1984) extended Vygotsky's concept of the ZPD by examining different elements that need to be present for development to occur. He introduced the notions of situation definition, intersubjectivity and semiotic mediation (p.8) in his explication of the ZPD.

Situation definition refers to participants' understanding or interpretation of the situation they find themselves in. Two people may ostensibly be involved in the same activity, but if their situation definitions do not correspond, they are in fact, participating in different activities. In the university context, when students are given an essay to write, for example, the lecturer expects them to share their idea of what is meant by the task. This presupposes that students analyse the topic correctly, undertake adequate research and report on it appropriately and that, in producing the essay, they execute the task set by the lecturer – whether it be to "discuss", "analyse", "critically assess" or "explain". However, lecturers and students often do not share the same situation definition of tasks and students fail to achieve the desired learning outcomes. Reasons for this mismatch in situation definition between lecturers and

16

students will become clear in the discussion on academic literacy, which follows in section 3.1.

Wertsch (1984) states that "humans actively create a representation of a situation; they are not the passive recipients of this representation" (p.8). What is required of a learner in the process of development, is that she gives up her "existing situation definition in favour of a qualitatively new one" (p.11). This results in a situation redefinition (p.11).

The second concept of *intersubjectivity* comes into play here. Wertsch defines it thus: "we can say that intersubjectivity exists between two interlocutors in a task setting when they share the same situation definition and know that they share the same situation definition" (p.12). Of course the situation definition of the mediating adult or more competent peer (let us call her the teacher) is different to that of the learner. The teacher takes on a situation definition which is deemed appropriate for the particular teaching-learning situation. Thus, at least three different situation definitions may be at play at a given moment in the learning-teaching interaction: the learner's and teacher's intrapsychological situation definitions and the one that allows the teacher to communicate with the learner. This third situation definition is established on the basis of the learner's intrapsychological situation definition and "represents objects and events in a way that will allow communication between adult and child" (p.13). Thus the teacher temporarily suspends her own situation definition in favour of one which will have value for the teaching-learning dialectic; a state of intersubjectivity is reached so that at the level of the teaching-learning dyad a particular situation definition is shared.

Wertsch notes that the ZPD is often defined by this third, "negotiated situation definition" (p.13). It sets up the level of development the learner is required to attain or is believed to be able to attain. Alternatively, it can be seen as the degree to which the learner needs to shift or is deemed capable of shifting or changing her initial situation definition. A new situation definition is thus developed by the dyad from the original definitions held by each. This requires the learner to give up her original situation definition in favour of the new one which develops as a result of a change in her understandings of the objects or events in question (Wertsch. 1984).

The third concept relating to the ZPD that Wertsch believes to be important in reaching intersubjectivity, is *semiotic mediation.* Intersubjectivity is mediated by language and other non-verbal semiotic processes such as indicating objects and facial expressions. Wertsch (p.14) explains that "a particular way of talking about the objects and events in a setting automatically sets the level at which intersubjectivity is to be established". In this way the semiotic processes do not merely reflect the present situation definition, but indeed create it.

2.1.3 Analogies to the ZPD

I shall extend this discussion by relating work done by Griffin & Cole (1984) on activity. They are concerned with researching activities that create opportunities for cognitive change in children. The ZPD is one notion they find relevant in developing thinking in this area. In addition, they discuss the merits of various concepts analogous to the ZPD used in American research literature, in providing appropriate metaphors, which can influence the structuring of teaching-learning situations.

Wood, Bruner & Ross (1976) have formulated the idea of *scaffolding* to refer to the degrees of adult intervention in learning opportunities for children. Wood claims that "adult tutorial interventions should be inversely related to the child's level of task competence – so, for example, the more difficulty the child has in achieving a goal, the more directive the interventions of the mother should be" (Wood, 1980 in Griffin & Cole, 1984, p. 47). Griffin & Cole are concerned that the scaffolding metaphor may be too limiting in that it presupposes a strong sense of an adult ordained end in mind and seems to leave little room for the learners' creativity.

Boughey & Van Rensburg (1994) finds the idea of scaffolding useful to describe a process approach to the development of essay writing that can influence the cognitive and academic literacy development of students. The essay writing process is broken up into a series of exercises that introduce students in a systematic way to progressively more cognitively demanding writing and research. They call the structuring of these exercises linear scaffolding. They use the notion of cognitive scaffolding to refer to providing formative comments which afford students opportunities to build their ideas in order to improve to their thinking and writing both qualitatively and quantitatively.

Another idea which interests Griffin & Cole (1984) is Leont'ev's concept of "leading activity" which refers to types of activity which seem to have the impact of propelling students' development forward in contrast to other types of activities which seem to be have little or no impact on students. A leading activity allows a learner to "reorganise his or her prior functioning". Learners who do not benefit from an activity have either already incorporated a particular development into their functioning, or they "are impervious to the sort of

opportunity that this activity Zo-ped offers" (p.50). (Zo-ped is the term used by Griffin &
Cole for the ZPD.)

From the discussion above it seems evident that an appreciation of the social nature of
learning is important for an understanding of the teaching-learning process. The process of
mediation that makes learning possible is complex and presupposes a sensitivity to the
learner's zone of proximal development. Appropriate mediation within the ZPD is required
for learning.

Griffin & Cole suggest that it is appropriate to think of real learning settings, as analogous to
apprenticeship settings, where adults and teachers support learning and create opportunities
for learning on several different levels. This is an idea which Rogoff has researched in much
depth (1995).

2.1.4 An apprenticeship model of learning

Vygotskian theorists use the notion of apprenticeship as a metaphor for the teaching-learning
process. It seems to be an appropriate metaphor and model for the teaching and learning
process which takes place within the university context (in so far as it does not subscribe to a
"spontaneous" internalisation or appropriation of specialised knowledge or skills).

 Rogoff (1995) suggests that sociocultural activity can be seen as a process of apprenticeship
where *guided participation* and *participatory appropriation* form the core phases leading to
development. These phases are not separate and independent of one another. Rather as one

phase of the process enjoys prominence, the other remains in the background. Alternatively, one may say that one could be a necessary condition for the other. The process of participation in the cultural activities of the knowledge community or community of practice, prepares new participants for later full participation in the community (1995, pp. 139-140). A knowledge community or a community of practice refers to a group of people who share knowledge and values of a particular kind. Bankers make up a knowledge community or community of practice who know about and practice within the world of finance and banking. In academia there are different knowledge communities, for example, psychologists or sociologists. As members of the communities of psychologists or sociologists they share specific ways of knowledge production and presentation.

The metaphor of *apprenticeship* refers to a model of the reproduction and generation of cultural knowledge of the community. In the academic environment the reading of books and the processes of expert thinking demonstrated in lectures serve to foster "more mature" participation in the community.

Guided participation refers to how individuals change through their participation in cultural activities alongside or under the tutelage of experts in the community. The novice gradually participates in authentic activities of the community and receives feedback, which serve as guidelines towards more appropriate behaviours. Davydov and Kerr (1995) concur that authentic teaching and learning imply a process of collaboration between teachers and learners (p.13). Thus guided participation occurs on the interpersonal plane. Mind is transformed through its activities within the knowledge community under the guidance of "more competent" or mature members of the community of practice.

Participatory appropriation denotes the process through which a novice changes and grows through participation with others, producing gradually more "accurate" approximations of mature cultural actions. Rogoff is at pains to explain that this change or development is one of "becoming" rather than acquisition. The participation in cultural activities therefore has a transformative effect on the novice's understanding of and ability to perform these activities. This is the generative process of the development of mind to which Vygotsky and Wertsch refer. It is an intra-personal process.

Rogoff avers that participation is in itself a process of appropriation as engagement in an activity requires the participant to make ongoing contributions, whether through actions or through attempts to understand the actions or ideas displayed by others (1995, pp. 150 – 151).

Brown, Collins, and Duguid (1993) also subscribe to an apprenticeship model of learning. They believe that learners need opportunities to perform authentic activities in authentic situations. When students have multiple opportunities to observe and practice authentic cultural behaviours, they learn concepts and imitate appropriate normative behaviours. Brown *et al* argue that learning is a process of enculturation (p. 34) in accordance with Rogoff's notion of appropriation.

3. Learning at university

Learning can be described as a process of development within a specific sociocultural context. The sociocultural milieu with which this study concerns itself is the university. The learners are first year university students. Learners who enter academia have to recognise, assimilate

and use various cultural expressions and rules typical of the university and their discipline specialities.

Within the university context the social communicative processes, such as lectures, tutorials, essay writing, and so forth, aim to influence the development of individual, psychological processes of cognitive development. Cognitive development will occur if students' prior learning experiences have prepared them for the higher level learning demands of university courses. Pascaul-Leone states that "performance at any time is synthesized by the … cluster of compatible schemes available in the brain's field of activation at the time of responding: the probability of this performance is proportional to the relative dominance of the cluster of schemes generating it" (1995, p.340). This idea is related to the notion of the ZPD.

Learners are active agents in the construction of their own knowledge. Constructivist theories use a building or engineering metaphor of knowledge production as opposed to a factory or input-output metaphor which assumes a more passive role for the learner (Marton, Hounsell & Entwistle, 1984). New knowledge and understanding are built on the structures of old knowledge. Interaction with new information and problems facilitate the construction of new knowledge.

3.1 Academic Literacy

Successful interaction with and demonstration of an understanding of the cultural expressions of the academy have come to indicate a specialised type of literacy known as *academic literacy* (Boughey, 1994, 1995; Taylor, Ballard, Beasley, Bock, Clanchy, & Nightingale,

1988). Academic literacy refers, inter alia, to the values underlying each discipline, ways of producing knowledge and ways of talking about knowledge. Discourse communities are defined by "peculiar ways of knowing, selecting, evaluating, responding, concluding, and arguing" (Bartholomae, 1985, cited in Starfield, 1994, p.17).

Boughey (1997) notes that each discipline within the academy has its own conventions and epistemology. Students in the different disciplines have to acquire the specific discourse of each discipline. They acquire academic literacies through their participation in the various cultural acts of academia, such as attending lectures, taking notes, reading academic texts, writing essays, and entering into dialogue with lecturers and fellow learners about the content and structures of these cultural acts.

Boughey (1997) observes that "people become literate by observing and interacting with other members of the discourse until the ways of speaking, acting, thinking, feeling and valuing common to that discourse become natural to them" (p.3). Because "becoming literate" is a process of socialisation, several language and AD practitioners have noted that academic literacy needs to be seen as a product of degree studies and not an expectation at the beginning of students' university careers, as seems to be the case if one looks at the way many curricula are structured (Boughey, 1997; Dison, 1997; Dison and Rule, 1996; Starfield, 1994). Thus students undergo an apprenticeship in order to become literate in the discourses of the academy.

Academics who teach in a university are part of a worldwide community who research their disciplines and communicate with other members of their disciplines across the world. They

can be said to belong to specific discourse communities. A literate person in the academic culture understands "how argument and evidence (are) structured and presented in his / her discipline" (Starfield, 1994, p.17). Each discipline has its own "language".

Successful students are those who can "crack the code" of a particular discourse community. More often than not they have to work out for themselves how the discourse community is constructed because in very few curricula is there explicit teaching of subject discourse. Cracking the code implies that, through interactions with lecturers and texts of the discipline, students are able to "determine what constitutes appropriate texts in each classroom; the content, structures, language, ways of thinking and types of evidence required in that discipline and by the teacher" (McCarthy, 1987, cited in Starfield, 1994, p.17).

Laurillard (1993) says, "students need help in practising the mapping between world and formalism, the ways of representing academic ideas and their interrelations" (p.58). The groundrules of academic literacy need to be made explicit to students. They require help with activating epistemic knowledge. In order for them to become familiar with the groundrules of disciplines, students are given tasks to do and problems to solve that will help them acquire knowledge and develop skills necessary for study in the discipline.

Dison and Rule (1996) write about academic literacy in a slightly different terminology. They argue that students need to acquire "disciplinary competence". The term competence "entails an integration of content and skills and is underpinned by affective factors" (p.86). Confidence to express knowledge and skills within a discipline is a necessary component of disciplinary competence. Further, "disciplinary competence requires not only thorough

integration of skills and content, but also an integration of discrete skills into generalized disciplinary competencies" (p.86).

Dison and Rule unpack the meaning of disciplinary competence with an example of an essay writing task, which requires students to compare two texts. They break the task down into the many discrete skills and knowledge the students would need to exhibit for the successful completion of the task: Students need a good sense of how the discipline works.
 This would include knowledge of the following:

- Codes: Linguistic (language/s; academic register; disciplinary terminology)

                         Visual e.g. movement (Drama and Film) and drawing (Architecture)

                         Auditory e.g. Music

- Conventions: Essay structure; referencing; researching

- Concepts: Key ideas and debates within the discipline

- Values: About what qualifies as knowledge and evidence

- Canons: Authoritative sources: primary texts; critics and commentators

- Skills: Cognitive and linguistic, in order to operationalise the above.

In addition, students would need the skills of synthesizing, summarizing, and analysing; skills in reading and writing; knowledge of genre, conceptual frames, and disciplinary dialect as well as the cognitive skills to execute the above (Dison & Rule, 1996, pp. 87-88).

3.2 Cognitive development of university students

Craig (1989) asserts that cognitive development can only be assessed through examining its perceived products. Cognitive growth is marked by several developments which students

exhibit in their disposition towards knowledge and learning, the values they expound and the apparent skill with which they perform and engage in academic tasks. In this section I am going to discuss a number of changes which represent the student's development towards a progressively more mature thinker who is *becoming* a legitimate member of the academic community.

The student's appropriation of the rules and values of the academy is seen through her higher order thinking skills which allow her to deal with complex, ill-structured problems, her development from dualistic thinking to an acceptance of cognitive relativism and her usage of appropriate languages for thinking. (These concepts will be explained in more depth in the following sections.) Sociocultural notions of learning and academic literacy as a subset thereof within the academic milieu, discussed earlier in this chapter, form the meta-theoretical framework for this discussion.

3.2.1 Higher order thinking

University students have to engage in what is known as *higher order thinking*. Higher order thinking is complex and non-algorithmic; there is no one clear-cut path or pattern towards a solution; there are multiple solutions to problems; learners have to weigh up many alternatives and negotiate uncertainties; they have to infer what is missing in a set problem. It involves generating and imposing meaning and finding a structure where there seems to be disorder. Higher order thinking involves nuanced judgement and interpretation. It is an effortful process which demands self-regulation from the learner (Resnick, 1987). Higher order thinking allows students to solve ill-structured problems.

27

Resnick argues that higher order thinking is, in fact, a feature of tasks which taxonomies tend to categorise as lower order skills, such as knowledge and comprehension. The act of reading, for example, demands a range of complex skills. She isolates four types of knowledge that have to be integrated in the act of making meaning of a text. The first type of knowledge is linguistic knowledge, i.e. knowledge of how sentences are formed and rules of forward and backward reference. In higher education the groundrules of the discourse community are also relevant. This knowledge is required for making inferences and is implicit when the learner is familiar with the language and the knowledge domain of the text. It is also imperative for the process of constructing a coherent notion of the relationships between ideas, events, actors and objects. The second type of knowledge is domain specific knowledge or what Resnick refers to as topical knowledge. Thirdly, readers use their knowledge of the rules that govern inference. Fourthly, reading demands knowledge of rhetorical structures, which are necessary for the process of interpreting and making meaning of texts. When the reader is skilled and the language and knowledge domains of the text are familiar, these skills and knowledge levels are implicit. However, when the reader works in an unfamiliar language and an unknown domain, she consciously has to invoke the strategies to aid her comprehension (Resnick, 1987, p.9).

When dealing with problems in the Humanities, higher order thinking skills come into play. In order to solve problems expert thinkers "elaborate and reconstruct problems into new forms; they look for consistencies and inconsistencies in proposed solutions; they pursue implications of initial ideas and make modifications rather than seeking quick solutions and sticking with initial ideas; they reason by analogy to other similar solutions" (Resnick, 1987, pp 15-16).

It is clear that higher order thinking is a complex process, which is demanded in even seemingly simple cognitive activities. However, the skills for this type of thinking are not always developed within the schooling system. Therefore, some students are unable to invoke these skills unless they are explicitly taught and practised. Thus the type of complexity inherent in non-algorithmic or ill-structured problems is difficult for students to deal with at first.

3.2.2 Kitchener's three level theory of cognitive processing

Kitchener distinguishes three levels of progressively more complex cognitive processing. *First level cognition* has to do with what an individual already knows and strategies that have already developed and includes cognitive functions such as reading, memorising, computing, language usage and acquisition. Second level cognition or *metacognition* concerns knowing about knowing. This refers to a learner's ability to monitor her strategies and progress on a task. Knowledge about cognitive tasks and the ability to gauge performance on task is included in the concept of metacognition. Metacognition also has to do with knowledge an individual has of herself as a learner.

Kitchener calls the third level *epistemic cognition.* This, she says, has to do with a meta-meta level of cognition. It involves knowledge about the legitimacy and truth-value of statements, what counts as knowledge, how it can be validated. It includes "knowledge about the limits of knowledge, … the certainty of knowing … and the criteria for knowing. Epistemic cognition incorporates strategies used to identify and choose between the form of solution required for different types of problems" (1983, pp. 225-226).

Research on adolescent and adult cognition seems to indicate that epistemic cognition has developed by late adolescence and plays an important part in the reasoning abilities of adulthood. It allows people to deal with problems, which have come to be known as ill-structured problems. These are problems for which there is no clear-cut and correct answer and whose solution requires the weighing up of sometimes conflicting evidence. It involves the ability to recognise that the same evidence can be used to draw divergent conclusions depending on the context and frame of reference used by the cognising agent. The ability to develop conclusions by synthesising conflicting evidence is a feature of epistemic cognition. This level of cognitive ability is what Perry (1970) terms cognitive relativism.

In contrast to cognitive relativism, which comes to characterise "mature" early adult thinking stands the absolute epistemologies of earlier thinking. This absolutist thinking precludes the thinker from recognising and solving ill-structured problems. Rather, the learner is limited to recognising and solving puzzles or algorithmic problems. These are problems for which there is one clear solution and definite strategies for reaching the solution. The types of problems which students studying the Humanities have to be able to solve are of the ill-structured variety.

3.2.3 Perry's nine stages of intellectual and ethical development during the college years

Cognitive structures are not regarded as a "given" within individual minds, rather, they are activated, and their form and content mediated, through social interactions. Perry (1970) investigated a related aspect of students' cognitive development in a longitudinal study of students from Harvard and Radcliff that spanned from 1954 to 1966. In this study he

categorised the forms of intellectual and ethical development of university students into nine levels. The first six are relevant to a discussion on students' cognitive development. During these six stages students evolve from a position of absolute dualism in their thinking to a position of contextual relativism.

Absolute dualism characterises the first position where there exists a single truth, the right answer or solution to problems. These truths are known by Authority, which is represented by the lecturer. However, the lecturer presents the students with a multiplicity of views. The student perceives this as Authority's way of leading her towards independent thinking. Hard work and obedience will lead her to the "Holy Grail".

In the second position the student perceives the multiplicity of ideas and uncertainties as unnecessary confusion brought to bear on her by an Authority who is perhaps poorly qualified; alternatively the exercises in working through diverse possibilities are meant to help her find the answer by herself.

The third position allows the student to perceive multiplicity as a reality with which even Authority struggles. She is not yet ready to give up her belief in Absolute truth. It is still out there waiting to be accessed. Thus multiplicity has a legitimate subordinate status within a sea of truth. She begins to question Authority's notion of quality and the relevance of hard work. As long as work is expressed well it seems to be perceived as of good quality regardless of how much work was done to get to a point of "good expression". Multiplicity is seen as something Authority wants. Perry argues that most students find themselves between

positions one and three by the end of first year / beginning of second year. However, others reach stage five during this time.

Multiplicity seems pervasive and gains the status of a legitimate domain in the fourth position. Sometimes the student reasons that any idea goes in a world where there are no right answers. Thus Authority has no right to judge her opinion. She sets herself up against Authority which still represents the dualistic world where right-wrong prevails. Alternatively the student sees contextual relativistic reasoning as a special category of what Authority wants her to do.

In position five the student's thinking reaches a point of contextual relativism where all knowledge and values are contextually dependent and relative. However, within this frame dualistic right-wrong thinking has a subordinate status in some special cases depending on context.

The student realises that within a world of relativism, she will have to take a stand by forming personal commitments. Position six sees the student setting herself up for impending commitment. In positions seven to nine the process of developing personal commitments comes to fruition. Perry indicates, though, that very few people reach a final stage of mature commitment during the first four years of study.

3.2.4   The role of a language of thinking in cognitive development

There is a language for thinking which includes words such as   "think, believe, guess, conjecture, hypothesis, evidence, suspect, doubt and theorize" (Perkins, *et al*, 1993, pp. 72-

32

73). According to Perkins et al., these are "more than just a set of convenient labels… conceptual development is involved" (p.73). Olson and Astington (cited in Perkins, et al., 1993) argue "that good thinking requires competence with concepts for managing how beliefs are to be held and how statements are to be taken" (p.73).

They further assert that a "rich language of thinking" allows for high level metacognition (p.73). The proper use of concepts for thinking is an indication of the level of cognitive engagement within the academic context. A well-developed language of thinking contains terms, which describe mental processes and products. It is a requisite for high level metacognition. It allows the student to understand the "illocutionary force" behind statements, for example, whether a statement is an assumption or a hypothesis; a belief or a certainty. Situations where students are called upon to communicate thought processes or products allow the language of thinking to be activated (1993, p. 73). The student is able to engage with the way ideas, questions and concepts are communicated and with the way thinking in the various disciplines is described or mediated to other members of the knowledge community. "Abstract conceptual structures" (Perkins, et al., 1993, p. 74) are used by powerful thinkers and are activated without obvious situation cues. Appropriate abstract conceptual structures help to organise inquiry.

An important factor to be borne in mind is the students' disposition with regard to thinking. Good thinkers have developed a disposition of inquiry. "What often distinguishes good from average thinking dispositions, is their abiding tendencies to be mindful, invest mental effort, explore, inquire, organise thinking, take intellectual risks, and so on" (Perkins, *et al*, 1993, p.

75). Cognitive growth is signified by changes in the way language and the tools that mediate understanding are used (Vygotsky, 1978).

3.2.5 The context-specific nature of literacies

The research of sociocultural psychologists has shown that the literacies learners come to develop, through social interactions in school and at home, either help or hinder their ability to learn within the school environment (Scribner and Cole, 1973; Tharp, 1997). Middle-class children are prepared for the literacy demands of school through the way their parents teach them to question and argue and not to accept one particular solution to a problem; they are socialised into making sense of how books and other printed material work. The various processes of school literacies are thus modelled by parents and in time appropriated by their children (Brice Heath, 1983).

Schools and universities operate on the assumption that this socialisation has taken place before students enter these institutions. However, it is clear from research that this is not always the case (Hendricks & Quinn, 1998). Tharp (1997) argues that schools have to adopt the socialisation role for children from working class parents if these children are not to be "at risk" of failure within the school system. AD practitioners, similarly, claim that universities have to explicitly teach the rules of their various discourse literacies to give students from all backgrounds the opportunity to enter into the discourse communities (Boughey, 1996, 1997; Dison & Rule, 1997; Grayson, 1995; Hendricks & Quinn, 1998).

When students are not socialised to participate in the taken for granted dominant mainstream literacy practices (Boughey, 1998) of the academy, they are referred to as "underprepared". In the next section, I shall analyse how we understand what it means to be underprepared for university study.

3.3 Underpreparedness

It can be argued that underprepared students find themselves in "a context where they must compete, within an unfamiliar context and in terms of unfamiliar groundrules, in order to succeed" (Moll & Slonimsky, 1989, p. 163). Moll & Slonimsky (1989) report that underprepared students are confused by the fact that a diversity of discourses with many groundrules exist in the university environment because for many of these students "educational activity has …been homogenised into *one* groundrule, 'replicate what is given'" (p.161, original emphasis).

Miller (1989) argues that there are two "theoretical abstractions" (p.158) which may help tertiary educators to understand students who may need to be taught the groundrules within the learning-teaching situation in order for them to be successful. He refers to under-prepared and over-prepared students. Under-prepared students "may have gaps in their knowledge and may require help to fill in the blank spaces" (p.158). In the case of over-prepared students the inadequate (for tertiary study) cognitive structures developed during twelve years of schooling may have become fossilised. That means that some learning patterns are over-learned and dominate cognitive learning processes. Students then need to unlearn the old structures and

conceptions or typical patterns of activity (Moll and Slonimsky, 1989, p.160) and develop or

learn new ones (Miller, 1989).

Miller suggests that "students need time and opportunities to construct not only new understanding but to learn the art of deconstruction; to gain insight into their own learning processes – constructive and deconstructive – by actively and persistently engaging in the very tasks that constitute university education" (p. 158). Moll and Slonimsky contend that learners need "to be taught to mobilise particular cognitive operations in the realisation of … contextually-specific skills" (p. 165).

Following Driscoll (1982) and Klausmeier & Associates (1979), Jones & Watson (1990) report that there is a correlation between students' information processing style and their level of cognitive development (p. 39). Information processing skills and appropriate levels of cognitive development are preconditions for the development of higher order skills. Jones and Watson discuss research that established that some American high school students do not develop beyond Piaget's concrete operational stage. High school students whose educational experiences have not offered them opportunities for engagement in formal operational thinking and who have not been exposed to abstract and analytical thinking, have not developed higher order thinking abilities.

Underprepared students (whom Jones & Watson believe often come from lower socio-economic backgrounds) are used to "repetitive drills" and their educational and social experiences often teach them to be followers rather than leaders. In South Africa, Grayson (1995) found that under-prepared students do not see themselves as having responsibility for

their own learning. They believe that this responsibility lies with the teacher. These students learn by rote and depend on the authority of the teacher rather than on internal volition. Under new learning circumstances these students can no longer rely on their repertoire of useful strategies; different cognitive strategies may be required.

Vygotsky asserts that "the specific structures and processes of intra-mental functioning can be traced to their genetic precursors on the inter-mental plane" (Wertsch, 1991, p. 27) Thus, if these "structures and processes" have not been exercised through joint productive activities, the students would not have had opportunities to appropriate these "structures and processes". Students who have practised problem-solving skills and have learnt to exercise and question authority within the teaching and learning context are more ready for university study.

The quality of experience within the teaching-learning process is instrumental in shaping the learners' understanding of the nature of academic learning. Miller argues that this has implications for orientations towards and conceptions of the learning process as well as for the development of cognitive structures (1989, p. 155). By cognitive structures he means patterns of activity which typify a learner's interaction with the social and material environment. It has to do with how a learner acts on and responds to (elements in) the environment. Cognitive skill, on the other hand, refers to how the units of cognitive structures are used or mobilised within specific contexts (Moll & Slonimsky, p.160).

Moll and Slonimsky (1989) have outlined three ways in which under-prepared students' schooling have trained them to think about knowledge. Firstly, the concept of argument as it relates to academic discourse is not appreciated. Rather, argument is understood to mean that

one sets oneself up in opposition to another. When knowledge is regarded as absolute, such a stance cannot be possible. Secondly, underprepared students' view of the kind of interactions one has with knowledge is limited. A text is not something to be interrogated, but to be learnt in its totality. Thirdly, the skills of questioning and paying selective attention are not seen to pertain to the academic environment. Students are able to use these skills within their everyday lives, but seem unable to activate them with regard to their academic work.

Sometimes learners who fail to demonstrate understanding could in fact be unaware of the fact that their performance on a task is inadequate, as their epistemic understanding of the task is limited. This state of affairs is analogous to Miller's (1989) example of the child who fails at a conservation task, not because she does not comprehend the concept of conservation, but because the task, as she interprets it, does not demand that she demonstrates an understanding of conservation (p.154). Thus, if a student's experience of academic problems is limited to the puzzle or algorithmic kind, she may fail at tasks requiring integration and synthesis of diverse possible solutions as is the case with ill-structured problems.

Miller further argues that knowledge is not produced merely through experiencing new phenomena; rather he purports that it is action that allows the learner to experience conflict with her present understanding that spurs on the development of new learning. A new concept must be experienced by the learner as unfamiliar or even contradictory to her present understanding to allow her to transform her understanding, acquire new knowledge and even develop new cognitive structures. Thus Miller's view is consistent with Vygotsky's belief that learning precedes development. It is through action, "any kind of activity mental or physical

that changes the way a situation (task) is experienced by the person who produces the action"
(p.156) that we come to know.

3.3.1   The role of information processing skills

Mental functions such as our abilities to use and understand concepts, solve problems, discern interrelations between concepts, and so on, cannot be understood separately from social actions and interactions (Vygotsky, 1978). In the same way, the manner in which we process information develops through sustained social interaction. In this section, I shall examine the different ways in which students process information. Information processing style or skills have their origins in activities within the educational and academic contexts from which students come. So like all cognitive processes, the development of information processing style has a sociocultural history (Moll & Slonimsky, 1989, p. 161).

Information processing style is akin to Saljo's (1979) approaches to learning. Surface level processing (lower order thinking) can be linked to a surface approach to learning. Moll and Slonimsky posit that a rote learning context is likely to invoke surface level processing. Saljo categorised this approach to learning as follows:

- Students have the intention to complete task requirements;

- They treat the task as an external imposition;

- They do not reflect about the purpose of a task or the strategies they employ to engage with it;

- They do not integrate the different elements in a task or text;

- It is difficult to distinguish principles from examples; (Craig, 1988a, refers to this as students' inability to distinguish between sign and signified or token and type.)

- Information is memorised for assessment purposes.

 (Säljo, 1979)

This approach is compared to a deep approach to learning where learners interact with texts vigorously with the purpose of improving their understanding thereof. A deep approach to learning is also characterised by the ability to integrate new ideas into an already assimilated knowledge base; learners are able to link principles to examples, evidence to conclusions and they are able to apprehend and assess the logic of a text structure (Saljo, 1979). This is thus a transformational approach to learning (Entwistle, 1997).

Craig (1988a, 1989) reports on the "contextually specific skills" in an analysis of the basic general academic literacy skills which under-prepared or poor students are unable to display. In her study, prior learning experiences did not support the kinds of development, which would have prepared students for the cognitive demands of university learning. Her analysis focuses on the cognitive processing capacities of learners. She discusses tasks which students have difficulties with at different levels of cognition. These different levels are what Kitchener (1983) terms first level cognition, metacognition and epistemic cognition.

While one might assume that for many students the shift in cognitive development will entail a development from being relatively adept at the first level of cognition, Craig's research has recognised that underprepared students not only experience problems with epistemic cognition, but also in relation to first level cognition. Craig's findings on the first level cognition problems of what she terms poor students are summarised below:

- Poor students relate to texts linearly. Each component of the text is given equal weight. Relationships between different parts of the text can therefore not be discerned. "Text" can refer to a reading or to a lecture, for example.

- Poor students relate to a text in a way, which she calls "out-of-focus-engagement". This "blurred" interaction with the text renders the student unable to support an argument with appropriate evidence from the text.

- Poor students' command of the written word is inadequate. They do not communicate effectively that they know and what they know.

- Poor students have the need to check their knowledge against evidence in the real world. Craig calls this "real-world bias".

- Poor students tend not to understand the interplay between sign and signified within a text.

- Poor students tend to think in "fixed categories". For them the world of ideas is assigned the same properties as the world of objects; objects are a matter of fact, whereas ideas can be propositional and tentative.

On the metacognitive and epistemic levels, poor students have trouble understanding and analysing both the form and the content of texts, whether authoritative works or their own attempts at academic writing. Poor students are unable to glean the properties, structure and conventions of academic discourse (textbooks, essays, interacting in tutorials) from their experience thereof. It is difficult for them to "apprehend the structure" (Laurillard, 1993, p. 50) of academic discourse in a spontaneous fashion (Craig, 1988a, 1989) merely by reading texts, listening to lectures, interacting in tutorials, writing essays. They may be unable to stand apart from these texts long enough to analyse and understand them as they are concerned with too many different levels of processing and attempts at understanding. Students may at first be

41

unable to engage their epistemic cognition as first level and metacognition take time to become part of their thinking structures within the new learning context with its new demands. This relates to Perkins' notion that sophisticated thinking requires an extensive knowledge base. While students are trying to extend their knowledge base, the epistemological questions remain less important.

4. Mediating learning opportunities for all students

The process of becoming a member of any community of practice is a complex, generative process. The knowledge and skills required of a full member are thus developed, over time, as the student participates in the various activities of the academic community and slowly appropriates its values of inquiry.

The diverse range of students who enter an English South African university in the late 1990s necessitates that the process of becoming a member can no longer be expected to happen spontaneously (Craig, 1989) although such an assumption used to be made when the student body was much more homogenous.

It is evident from the research into students' cognitive development discussed in this chapter that the learning-teaching process is a complex one. Given the diverse backgrounds of students, mediating learning needs to take account of a wide range of competencies which the students need to acquire.   These competencies include reading academic texts, writing, conducting research, learning to participate in academic discussions with peers and teachers,

negotiating the multiplicities of meanings, views and orientations within the various disciplines of study, to name but a few.

The diverse levels of student competence and prior experience obviate a range of mediational means. Research which aims to find the best ways of mediating learning for the largest number of students in a cohort, has proliferated over the last two decades, both in South Africa and abroad. A common denominator in the conclusions reached in this research points to the need for student academic development to form an integral part of the curriculum (Zuber-Skerrit, 1987). It is clear that the teaching of discrete skills in isolated skills modules in the hope that these skills will be transferred to and across the content areas is a futile exercise (Boughey, 1995).

It seems appropriate for tertiary institutions to make available various means to help students become academically literate in ways which are integrated within the disciplinary teaching-learning context. Examples of current practice which aid academic literacy development include using student writing as a vehicle for conceptual development; developing student writing through making the writing process a recursive exercise that helps to make thinking explicit, through responding to drafts of students' essays; tutorials (face-to-face and computer assisted) and group discussions that provide students with opportunities to clarify conceptual understanding and learn from the approaches of fellow students.

In the next chapter I shall explore peer collaborative learning as one way in which student learning development may be successfully mediated.

CHAPTER THREE

PEER COLLABORATIVE LEARNING

1. Introduction

In this chapter I shall discuss collaborative learning. It is seen as one way in which the learning needs of diverse students can be mediated. Collaborative learning is an umbrella term for many different types of learning situations where groups of students are involved in mutual explorations; where the teacher is not the chief actor in the teaching–learning dialectic. Types of collaborative learning include, amongst others, cooperative learning, problem-centred learning, writing groups, peer learning, discussion groups and seminars.

The social context of the collaborative learning environment is important. Students learn through "the social stimulation of mutual engagement in a common endeavour. This mutual exploration, meaning-making, and feedback often leads to a *better* understanding on the part of students, and to the creation of *new* understandings as well." (Smith & MacGregor, 1992, p.10-11, my italics).

Collaborative learning classes are structured so that students work together on problems. The teacher's role is that of "facilitator of knowledge rather than conveyor of knowledge" (Sampson, Vorster, Burton & Collet, 1999, p.8), but the class is set up in such a way that the students provide challenges, set up inquiries to try and deal with the challenges, and develop solutions to problems. A relevant question here is whether collaborative learning can do this

for students from learning backgrounds where they were given very little autonomy. I shall discuss this later, with reference to the research data.

2. Collaborative learning in higher education

Collaborative learning is not commonly used in higher education. However, its history dates back to at least the 1950s when Abercrombie researched the process of learning to make diagnostic judgements with medical students at the University of London. She found that those students who worked on problems of diagnosis in collaborative groups learnt the skill quicker than those who worked on the problems individually. The quality of their judgement was also superior. She concluded that collaborative inquiry was more successful than individual inquiry in the development of diagnostic judgement (Abercrombie, 1974).

2.1 Collaborative learning and the building of communities

Treisman (1986) did landmark research on the positive effects of collaborative work in higher education at the University of California in Berkeley. He was puzzled by the fact that Asian-American students performed much better at mathematics and science than other ethnic minorities like African-American and Hispanic students. He followed the students around and discovered that the Asian-American students moved around in "packs": they ate, studied and attended class together. They were continually engaged in conversations about their work. In contrast, the African-American and Hispanic students were isolated from each other and worked alone.

Treisman set out to find out why this was so. He found that the African-American and Hispanic students felt socially marginalised at their university. Their high school experiences did not prepare them for university study and in their experience, only the weak, students studied together. Academic achievement was often negatively associated with social prestige in their home communities.

In order to change this situation, Treisman developed a programme that would force his minority students to become more of a student community. He invited them to join an honours discussion group. He structured peer collaboration into the teaching-learning process by expecting peers to check each other's homework. In class, collaborative small groups were used to facilitate the solving of difficult problems. Treisman's intervention thus affirmed these students' academic potential while teaching them the benefits of a collaborative learning context. The result was that many of these previously "remedial" students became A and B grade students. Treisman concluded that conversation, a sense of community and positive self-concept were vital elements for successful learning (Nelson, 1994).

2.1.1   Collaborative learning and the transition from school

Bruffee (1993) argues that collaborative learning is a re-acculturation process. It provides students with a bridge from their old school learning communities where knowledge was seen as finite and vested in the authority of a teacher and a textbook, towards the new university community where they have to learn to operate within an environment of contextual relativism. In a collaborative learning context students come to experience knowledge as "something people construct by talking together and reaching agreement" (p.3).

Bruffee sees collaborative learning groups as "low-risk" transition communities or support groups" (p.4) where students can "try on" the language and behaviours of the new discourse communities they are trying to join.

2.1.2   Utilising the influence of peers

The peer group plays an important role in helping individuals build on and develop new values and attitudes that are in tune with their new learning context. Collaborative learning groups allow institutions to mobilise the

> peer group influence around intellectual concerns: taking advantage of the nature and extent of college and university students' influence on one another to help them recognize 'new facts or widened perspectives' and 'better mediate and reinforce the academic and intellectual influences which colleges are presumably capable of exerting'(Bruffee, 1993, p.6)

Bruffee (1993) contends that collaborative learning has the potential to mobilise the force of the peer group in students' development (p.6).

Johnson, Johnson & Smith (1991) suggest that peer relationships play an important role in social and cognitive development. Peers can be models of positive values and attitudes. Spending time with peers in productive relationships could provide opportunities for direct learning and reinforcement of these values. They argue that, without peer relationships many forms of "prosocial values and commitments could not be developed" (p.49). Peer relationships teach students to view problems from perspectives other than their own and provide a social mirror against which one can view oneself.   The social sensitivity that is required for autonomous behaviour can be developed through being part of a supportive peer group as it offers opportunities to learn from others what is expected within the social

47

environment. Johnson *et al* further assert that fellow students can be the single most important influence on students' educational aspirations (pp. 49 – 50).

Peer collaborative learning offers opportunities for learning which are qualitatively different from the learning which would occur if a teacher were to facilitate the process (Topping, 1997; Wells *et al* 1990). Peer interaction allows learners the freedom to bring their existing knowledge to bear on a problem. They actively interpret the available information through asking questions and searching for answers. Research quoted by Wells *et al* indicates that the power relations between learners and teacher militate against this kind of collaborative construction of knowledge (p.112).

The interactions amongst students can have a motivating effect on members of the peer group. The peer group regulates the activities and monitors progress; the peers provide feedback, support, encouragement and motivation. This could play a role in the development of more positive attitudes towards the subject area studied (Johnson & Johnson, 1985, p.119).

2.1.3   Collaborative learning and student diversity

Collaborative learning builds learning communities (Smith & MacGregor, p.18) by utilising the diversity inherent in a group. Students are diverse in areas such as educational background, language and cultural experiences, learning styles, levels of understanding and prior knowledge. Collaborative learning groups provide a platform for joint productive activity that has a series of potentially positive effects.

This diversity has the potential to set up cognitive controversy within the group and within individual minds. Johnson & Johnson (1985) see cognitive controversy as an important feature of this learning environment. Cognitive controversy refers to "conflicts among the ideas, the opinions, the conclusions, the theories, and the information of group members" (1985, p.115). Controversy "promotes epistemic curiosity or uncertainty about the correctness of one's views, an active search for more information, and, consequently, higher achievement and retention of the material being learned" (Johnson & Johnson, 1985, p.115). Kagan (1986) and Nijhof & Kommers (1985) concur that cognitive controversy stimulates learning in cooperative groups.

Johnson, Johnson & Smith (1991) suggest that students who work in competitive or individualistic settings do not have the opportunities offered by the cooperative inquiry environment where "a reconceptualization of one's knowledge and conclusions, and, consequently, greater mastery and retention of material being discussed" (p.33) can occur.

3. Features of collaborative learning

Collaborative learning groups differ from traditional learning groups in significant ways as suggested in Table 1.

Table 1: A comparison between cooperative and traditional learning groups.

Cooperative Learning Groups	Traditional Learning Groups
Positive interdependence	No interdependence
Individual accountability	No individual accountability
Heterogeneous membership	Homogeneous membership
Shared leadership	One appointed leader
Responsible for each other	Responsible only for oneself
Task and maintenance emphasized	Only task emphasized
Social skills directly taught	Social skills assumed or ignored
Teacher observes and intervenes	Teacher ignores groups
Group processing occurs	No group processing

(Johnson *et al* 1991,p.25)

Positive interdependence refers to the fact that students share the same goal and enter into a commitment to help each other attain that goal. It depends on face-to-face promotive interaction where individuals help each other by providing challenges to promote understanding. Individuals develop a sense of personal responsibility for developing each other's understanding.

Research by Barnes & Todd (1977) seems to indicate that students need cognitive and social skills for productive small group interactions. The social skills needed include the ability to monitor and control the group's progress through a task, the abilities to manage conflict and competition, the ability to modify and use different viewpoints and a willingness to give and receive support. They further indicate that useful behaviours for effective interactions include soliciting opinions, encouraging explicitness, indicating differences and making connections between viewpoints. The cognitive skills include problem setting, venturing hypotheses and using evidence. Therefore, collaborative learning demands a degree of metacognitive awareness from participants.

3.1 The benefits of peer teaching and verbalising

In cooperative learning-groups learners have the opportunity to act as "teachers" to fellow learners. Bargh & Schul (1980) have studied the cognitive benefits of teaching for the tutor. They suggest that in preparing to teach or explain ideas and concepts to another in a coherent way, a speaker has to engage in the task of cognitive restructuring of her knowledge. This allows the "teacher"

> To see the issue from new perspectives, enabling him or her to see previously unthought of new relationships between the discrete elements. It may be this building of new relationships that facilitates a better fundamental grasp of the material. (Bargh &Schul, 1980, p.595).

Webb's (1985) research indicates that giving and receiving explanations as opposed to merely giving or receiving information seem to be beneficial to achievement. Kagan (1986) agrees that the demand for clear communication amongst participants promotes high quality learning and influences long-term retention. Fletcher (1985) argues that giving explanations is a form of cognitive facilitation. I understand this to mean that the process helps students to develop their understanding of concepts or problems.

According to Johnson & Johnson (1985) the discussion process in cooperative groups contributes to the development of higher quality cognitive strategies for learning, and students use higher order thought processes (p.115). Oral rehearsal has a positive influence on storage of information and promotes long term retention of information (Johnson & Johnson. p.116).

Swing & Peterson (1982) conclude from their research on interaction in heterogeneous groups that high achievers benefit from giving explanations to others. Students seem to perceive

51

detailed explanations as better and this is significantly related to group achievement. Low achievers are helped if they receive adequate responses to specific questions (Cohen, 1994). Swing & Paterson found that low achievers benefit especially from participation in heterogeneous groups whereas average achievers seem to benefit more from engagements in homogeneous groups (in Cohen, 1994). Tudge (1990) came to similar conclusions and suggests that exposure to high-level reasoning positively influences students' learning from more competent others.

Webb (1982) takes issue with research which indicates that mere vocalizing has a positive impact on understanding. She quotes research by Durling & Schick (1976) which indicates that the purpose of the vocalizing seems to be the important variable. They studied the results of interactions between peers, vocalising to a confederate and vocalising to the experimenters. They found that when students explained concepts to their peers or to confederates the impact on achievement was greater than if they verbalised to the experimenters. They concluded that when students spoke to peers or confederates, they may have viewed themselves as teachers, whereas in interactions with the experimenters, they saw themselves as students.

Barg & Schul's (1980) findings concur with the above. When students are involved in actively teaching someone else, they are involved in a complex process of information restructuring, which helps them to present clear explanations. Slavin (1980) suggests that sharing of ideas and resources and the process of group feedback help group members to restructure their ideas and think about problems in ways which they may not have been able to do on their own. The group learning context provides the space for the process of knowledge construction to be made public and externalised.

52

Wells, Chang & Maher (1990) argue for three kinds of talk to be present in the teaching-learning process, each with its own benefits: (I) Talk between learners where they can share their expertise and their ignorance. (ii) Tutorial-talk where students can benefit from the expert guidance that responds to their particular needs. (iii) Opportunities to reflect on their learning through writing, reading and inner speech (p.101).

Bruffee (1993) notes that collaborative learning tasks create opportunities for students to learn to "speak differently" and in the process they develop an intermediary language on the road to negotiating membership of the new discourse community. Students can invest trust in a small group of fellow students with whom they can risk exposing their ignorance and can show their expertise. Through this they build up the confidence to venture their views in front of a whole class.

Bruffee (1993) makes the point that in order for students to engage in "constructive, reacculturative conversation" (p.24) they have to be willing to invest authority in their peers and in turn accept the authority the peer group bestows on them. They have to be comfortable with a state of interdependence in relation to their fellow students. He argues that interdependence is one of the most important skills students will learn in their time at university, as it demands both social and intellectual maturity (p.2).

3.2 The issue of the authority of knowledge

Wells, *et al* (1990) argue that an interactive learning environment where learners are seen as having significant contributions to make towards developing their understanding of a task or topic has a positive impact on the quality of learning. They argue that students' unequal or limited knowledge base should not be seen as a hindrance to accepting them as partners in the process of knowledge making as the more or less equal power between peers in a collaborative situation could have positive effects for student learning. The difference between a transmission mode of teaching and learning and a collaborative mode "lies in the nature of the discourse itself, which arises from the way in which the participants relate to each other and the topic that they are addressing" (p.99).

For collaborative learning to succeed, students need to give authority to fellow students and accept authority from them. Many students struggle with this. A number of reasons for this are advanced in the literature. Bruffee argues that students who view teachers and texts as purveyors of knowledge are unable to see knowledge as socially constructed and contested (1993). A second reason relates to the fact that many high schools are competitive environments. Students compete on a national level for places in good tertiary institutions and for financial assistance. Within an environment of tough competition there is little room for cooperation. The third reason relates to the second one. Students do not have the skills for cooperative work (Bosworth, 1994). Cooperative skills can, however, be learned through direct teaching and through modeling cooperative behaviours (Bosworth, 1994).

The collaborative classroom makes considerable demands on students to reframe their role from passive observers to active participants in the learning process. MacGregor (1992) has outlined some of the changes in focus that students have to undergo in order to work successfully in collaborative learning groups. They have to shift:

- From listener, observer, and note-taker to active problem-solver, contributor and discussant;
- From low or moderate expectations of preparation for class to high ones;
- From a private presence in the classroom (and few or no risks therein) to a public one, with many risks;
- From attendance dictated by personal choice to that having to do with community expectation;
- From competition with peers to collaborative work with them;
- From responsibilities and self-definition associated with learning independently to those associated with learning inter-dependently;
- From seeing teachers and texts as the sole sources of authority and knowledge, to seeing peers, oneself, and the thinking of the community as additional and important sources of authority and knowledge (p.39).

Thus students have to learn to straddle the uncertainties of new roles for themselves and their teachers in order to reap the benefits from collaborative learning structures. This implies the development of metacognitive awareness with regard to their role in the teaching-learning process. Finkel & Monk (1992) report that it takes a long time for group members to begin to act independently of the group leader and to form reciprocal relationships with one another. Students resist the teacher's (or group leader's) move from the centre to the periphery as it seems as if she is abdicating responsibility (p.52).

3. 3 Interactions required for higher level engagement

According to MacGregor (1992), collaborative learning engages many minds in the same task at the same time and therefore has the potential to "unleash a unique intellectual and social

synergy" (p.37). However, she warns that unstructured, freewheeling explorations seldom provide enough challenge to students to engage in the learning process. They need to be stimulated by puzzling tasks or questions and they should have a clear sense of the expected outcomes (p.38).

Cohen (1994), in a review of the literature on cooperative learning, isolates some of the conditions which make for productive small groups. The kind of productivity that this research is concerned with relates to conceptual learning and higher order thinking. Researchers who work within a social constructivist paradigm believe that productivity comes about as a result of engagement in a process of discovery when students are involved in high-level discourse working on ill-structured problems (Cohen, 1994).

The type of interaction that is most effective will depend on the nature of the task students engage in. Routine tasks, where students have to learn facts or come up with simple right-wrong answers, require them to be helpful by offering substantive and procedural information. Conceptual, higher-order learning, on the other hand, requires more complex interactions between members of a group. These interactions require students to share ideas, hypotheses, strategies and speculations (Cohen, 1994, p.4).

Chang & Wells (1987)) argue that learning involves "problem-solving where the planning and execution of tasks are brought under conscious control" (in Cohen, 1994, p.6). Students thus have to clarify what their goals are, plan procedures, generate and select alternatives and review and change plans if appropriate. Thus metacognition is activated by active participation in collaborative learning.

Cohen (1994) reports on research done on the interactions of dyads by Schwartz, Black & Strange (1991). They found that students needed to be able to "create agreed-on representations" of a problem in order to be able to work on it. This finding confirms Wertsch's (1984) analysis of the ZPD where one of the steps in creating the ZPD includes the creation of intersubjectivity. Thus students need to be aware of and strive to reach inter-subjectivity so that they are all engaged in more or less the same task at the same time. Schwarz *et al* argue that tasks that require students to make abstractions and require and enable representational negotiation are good for productivity.

Cohen concludes that the various studies she reviewed suggest that students need to be taught the skills for discourse, either before or by means of cooperative work. Bruffee's work (1993) suggests, though, that collaborative work is a vehicle for discourse development. Thus groups need the kinds of tasks that will require them to use subject and interactional discourse and the kind of facilitator who helps them to shift to higher levels of discourse engagement.

4. Collaborative learning tasks for cognitive development

Student activity is the most important element in collaborative learning. The types of activity that are helpful in collaborative learning include asking questions, helping to answer other students' questions, developing hypotheses, developing a language for interacting in the discourse of the subject, creating mental models and writing to clarify ideas and conceptual understanding.

Webb, Ender & Lewis (1986, cited in Cohen, 1994) found that, without the help of an instructor, students tended to operate at the lowest level of abstraction. Nelson (1994) concurs that, if left to work entirely on their own, students are likely to work at low levels of abstraction. He suggests that undergraduate students typically relate to tasks with dualism or multiplicity. He argues that students need the intellectual scaffolding that will allow them to approach tasks at more sophisticated levels of thinking.

Nelson (1994) suggests three ways in which that scaffolding can be provided: by furnishing students with or helping them to develop models or frameworks that afford them opportunities for metacognition; by suggesting alternative possibilities within disciplinary discourse, or, by introducing learners to uncertainty and cognitive relativism by offering alternatives to be compared and criteria for comparing them (p.54).

Nelson further argues that collaborative interactions need to be structured through preparation, cognitive structuring and role structuring. *Preparation* refers to selecting points for discussion about which students have some shared, relevant knowledge. Opportunities for *cognitive structuring* are provided through questions or analytical frameworks that force students to engage at higher levels of thinking. *Role structuring* has to do with providing occasions for meaningful participation for all members of the group and engaging ways that will minimize behaviours that inhibit participation and progress.

The structuring of the interaction happens in a number of ways. In Supplemental Instruction, the collaborative learning programme that is the subject of this dissertation, *preparation* and *cognitive structuring* can happen through tasks set by the lecturer that students require help

58

with and take to the group. Alternatively, students can suggest their own points for discussion based on interests or difficulties. *Preparation* and *cognitive structuring* are also tasks of the group leader if she is able to assess students' zone of proximal development. *Role structuring* is the task of the leader who has to be sensitive to allowing all students opportunities to participate. She also has to be aware of and minimize conditions that will inhibit participation and progress.

5. Supplemental Instruction (SI)

SI is a peer collaborative learning programme where trained senior students act as group leaders for first year learning groups. SI is normally instituted in so-called high-risk or historically difficult courses. It is a means of formalising learning groups and making the process of active group learning available to larger numbers of students who would not normally consider forming or joining a group. The aim of SI is to help students come to grips with difficult concepts in a course while helping them to develop the requisite skills to master the concepts.

SI straddles a balance between being linked to specific courses while at the same time functioning as an out-of-classroom learning environment. According to Kuh, Douglas, Lund & Gyurnek (1994) out-of-classroom experiences have a greater and more lasting impact on students than do classroom experiences. It thus makes sense to integrate these experiences into the overall learning programmes of students.

SI differs from small group tutorials in a number of ways. It is voluntary, whereas tutorial attendance forms part of the DP requirements for most courses. Most tutorials are tightly

structured in that the tutor has a certain number of questions or problems to work through during the tutorial time. They are thus directed towards satisfying curriculum demands. Tutors are often directive and some tutorials become mini-lectures rather than opportunities for students to test and develop their conceptual understanding. SI, on the other hand, is aimed at facilitating the meeting of students' needs as opposed to the needs of the lecturer. The students set the agenda or the SI leader assesses the needs of the group through questioning their grasp of concepts or facility for working through problems. The SI process is much less formal than tutorials and the SI leader is seen as one of the group, a fellow student, albeit older and more experienced. The SI leader is seen as a model student who has found successful ways of mastering the course. Her job is to share her experiences as a successful student of the course with the SI group.

The informal nature of SI sessions is an integral part of what makes it a learning context which is at once integrated in the students' learning programme and apart from the formal structures of that programme. Thus SI has an important social function in creating learning opportunities for students (Hillman & Mc Carthy, 1996).

> The SI system is designed to focus precisely on understanding and skill development and greatly improves the success of these processes by getting students to work together in groups and enabling them to build their own understanding by participating actively in groups in an informal and non-threatening environment. (1996, pp. 97-98).

Following Goodlad & Hirst (1989), Smuts (1996) discusses some of the benefits that accrue to students who teach other students. Goodlad & Hirst isolate four theoretical frameworks they perceive as relevant to peer tutoring, namely role-model theory, socio-linguistic theory, gestalt theory and behaviorist theory. I concur with Smuts that their discussion on the role of behaviorist theory seems irrelevant for the theoretical framework of Supplemental Instruction

and indeed this dissertation. Role-model theory, socio-linguistic theory and gestalt theory are more useful in conceptualising the benefits of peer tutoring.

Allen (1976) notes that the concept of social role is important in that it is associated with expectations developed and specified within the context and in relation to other roles within a social structure. According to role theory, people are either constrained or motivated by the expected roles they occupy. This may explain how students come to be predominantly passive in learning environments; the teacher is perceived as the font of knowledge and the students "receive" knowledge rather than actively constructing it. Peer collaborative learning on the other hand, sets up expectations of mutual learning and teaching amongst members.

Socio-linguistic theory argues that children's upbringing equips them with different patterns of speech, perception and therefore ability to perform within the formal, specialised milieu of school. Bernstein (1964, 1965, 1970) argues that working class children are brought up with a 'restricted code' of speech that is weak in general concepts. Children from middle-class homes, however, are socialised within a milieu of elaborated speech codes, rich in concepts and they cope very well within the school environment. Research by Lawton (1972) discussed by Goodlad & Hirst indicates, that working-class children *can* learn the elaborated speech codes and rich concepts necessary for success in school. This concurs with more recent research by Newman, Griffin, & Cole, (1989) & Tharp (1997) that found that working-class children improve their performance in school when they are immersed in learning contexts that help them to develop appropriate languages for learning. Teacher-student communication assists in developing elaborated speech codes. Goodlad & Hirst (1989) suggest that peer tutoring can play a positive role in this regard too.

According to Goodlad & Hirst, gestalt theory suggests that learning occurs when learners are able to situate ideas within larger contexts or intellectual structures. In peer tutoring participants can learn from how others relate ideas to broader contexts. The process of offering learners opportunities to develop their understanding and awareness of how ideas fit into the bigger picture of what is being learned promotes cognitive development. Goodlad & Hirst note that these different theories do not conflict, but offer different perspectives and ideas for different types of activities that may be utilised in peer tutoring to facilitate learning.

Smuts (1996) distilled some of the benefits that accrue to students who teach others based on the above theories as discussed by Goodlad & Hirst (1989 pp. 61-62):

- They develop a sense of personal adequacy (role-model theory)
- They find a meaningful use of the subject matter of their own studies (gestalt theory)
- They reinforce their own knowledge of fundamentals (gestalt theory)
- The adult role and status of teacher leads them to experience being part of a productive society (role-model theory)
- They develop insight into the teaching-learning process and can cooperate better with their own lecturers (gestalt and role-model theories) (Smuts, 1996, p.130).

These benefits refer to qualitative developments to students' learning and development. However, most of the research into SI has focused on assessing the effectiveness of the programme and are thus quantitative studies.

5.1 Research on SI

Most of the research on SI has focused on the correlation between SI attendance and academic achievement. This research consistently shows that regular SI participants out-perform non-SI participants by significant margins. In the United States research indicates that SI students

achieve half to one grade point higher than their non-SI counterparts. In South Africa a positive correlation between attendance and achievement has been found in most studies. See for example Hillman & Mc Carthy (1996), Koch (1996) and Smuts (1996).

Mc Carthy, Smuts & Cosser (1997) express concern that the statistical analyses deployed in most of the research that aims to assess the effects of SI on student performance are highly inadequate. These analyses do not take account of many of the independent variables that can impact on student achievement. Most research involves a comparison between students who have attended a given number or more SI sessions and those who have attended fewer than this number, or no sessions at all (e.g. Martin *et al*, 1990; Congos & Schoeps, 1993; Koch, 1996).

Mc Carthy *et al* take issue with this type of analysis on several grounds. Firstly, it assumes that all factors influencing performance are identically distributed across all SI and non-SI students. Secondly, Martin *et al* claim that they factor in academic preparedness as measured by matric results or "prior academic achievement" (1992, p.24) and academic ability at university as it relates to academic success. Mc Carthy *et al* however, suggest that there is not a high correlation between academic preparedness and academic success. One of the reasons for this discrepancy is that university learning requires qualitatively different kinds of thinking skills to most school learning. Thirdly, traditional analyses take account of motivation as a factor in SI student success. However, this research does not distinguish between motivation to succeed at the course and motivation to attend SI. Mc Carthy *et al* conclude that there are various factors that influence student success and that it is very difficult to claim success on account of SI attendance only.

An alternative multivariate regression analysis using, *inter alia*, SI sessions attended, academic ability in the university environment (as measured by the aggregate of all common courses in the curriculum, excluding the course in which SI is implemented), and level of preparedness as independent variables is suggested by McCarthy *et al*. The dependent variable will, of course, be the final course mark in the SI supported course.

There is a dearth of research investigating the nature of interactions in SI groups. An examination of interactions within SI may illuminate why SI students seem to outperform non-SI students. Cohen (1994) and Webb (1992) have made suggestions regarding the type of research required in relation to cooperative learning. Their research, as indicated earlier, is based on cooperative learning at school level. The literature on the effectiveness of SI reveals that there is a need for different kinds of investigations in order to develop our understanding of what makes SI effective (Mc Carthy *et al,* 1997 and Smuts, 1997). This type of analysis will contribute to an understanding of how to increase the effectiveness of SI in cases where it is not so effective.

Mc Carthy *et al* state that given the limitations of statistical proof of the effectiveness of SI, "Future analyses of the effectiveness of SI might profit from soliciting continuous *qualitative* feedback - in the form of surveys, interviews, and informal discussion – from SI students themselves on the benefits to them of the SI programme" (1997, p.225).

The approach in this research was not to assess the *effectiveness* of SI in relation to student achievement, but to assess the *quality* of student interactions in SI that may improve or inhibit

student understanding and subsequent achievement. SI offers the study group (the leader and SI students) almost total autonomy (within the confines of the SI model which is based on an active, collaborative learning framework) to choose topics for discussion and to decide how to develop their understanding. Slavin (1980) suggests that an important question for collaborative learning research would be to assess what the effects of high student autonomy are on outcomes of cooperative learning (p.239). The outcome I am interested in relates to quality of student interaction.

Cohen (1994) suggests that relevant research in the field of collaborative learning needs to focus on the nature of understanding that emerges from group interaction, the kinds of social and cognitive skills necessary for engagement in productive group work and how different tasks affect the type and quality of interaction produced in a group.

If one considers research on cooperative learning in schools, there are several suggestions as to the types of activities and interaction patterns, leadership interventions, and so on, that could potentially either hinder or significantly contribute to productive activity in SI groups. This research aims to make a contribution in this regard.

5.2 SI at Rhodes University

SI was introduced to Rhodes University in Grahamstown in 1994. It was first introduced into the Departments of Law and Psychology. Other departments in the Faculty of Humanities followed. Through the years it has become evident that the programme is most successful in departments with large classes and where the work is conceptually challenging.

SI leaders are chosen jointly by the department and the SI coordinator who is employed by the Academic Development Centre. The training of SI leaders follows broadly the training programme set out by the initiators of SI at the University of Missouri, Kansas City (1995) but has been contextualised for the South African and the Rhodes University context.

SI leaders find it challenging to get all students actively involved in the teaching-learning process in SI sessions as will be seen from the data. Much of this difficulty stems from the educational history of students. However, students from a range of backgrounds report that they find SI beneficial and cite SI as a positive influence in their academic success (Davies & Vorster, 1994).

6. Conclusion

In this chapter I have discussed the role peer collaborative learning can play in helping first year students to become part of the community of scholars. I have indicated that SI is a form of collaborative learning where a senior student leads the group in order to ensure that the learning is taken to higher levels than may be possible if students are all at the same level of cognitive development. There seems to be a need for research that investigates how SI makes a contribution to student development. This research project strives to make a contribution in that regard.

CHAPTER FOUR

THE STUDY

1. Introduction

In this chapter I consider my research orientation, including aspects of qualitative research methodology as they pertain to sociocultural research. The research methods employed in this study are illuminated. Finally, I discuss issues of validity, generalizability and ethics with regard to this study.

2. Aims of the research

The aim of this research was to gain an understanding of the process of collaboration in Supplemental Instruction groups in first year classes at Rhodes University. In the previous chapter I indicated several claims made for collaborative learning. I wanted to investigate the circumstances under which collaborative learning occurs and the factors that contribute to creating learning opportunities in collaborative learning groups. The main research question thus concerned the process of interaction that spawns learning in organised peer groups. According to many researchers, the best way to study process is through qualitative research methodology.

The learning process is a social one. When examining the learning process, social influence and individual learning are difficult to separate. Rogoff *et al* (1995) see learning and development within a sociocultural perspective as a "process of changing participation in

cultural activity". They claim that no activity is purely individual (1995, p.131). Rogoff (1990) claims that individual development (learning) can not be studied separately from the social context within which it occurs. It thus makes sense to look at collaborative learning through studying collaborative learning processes in real-life settings. The interactions of individuals are influenced by the actions of others as well as by other elements of the social context. I have thus decided to study collaborative learning processes as they occur in Supplemental Instruction (SI) groups in first year classes at Rhodes University.

3. Research orientation

Ratner (1997) argues that qualitative research needs to be based on sound ontological and epistemological assumptions. He outlines three ontological principles underlying qualitative psychological research. Firstly, he asserts that psychological phenomena are complex and multifaceted and they develop from relationships with other phenomena. Secondly, complex psychological phenomena find expression in extended responses. Thus the external signs of these phenomena can be as complex as the phenomena themselves. Thirdly, psychological phenomena are forms of mental activity or consciousness (pp. 55-58).

The epistemological questions with regard to psychological research stem from our understanding of the nature of these phenomena. The nature of the phenomena dictates how they can be known. Ratner states that "the task of inferring mental activity from extensive expressions is the central and distinguishing concern of qualitative methodology" (p.59).
 This task of coming to understand psychological phenomena requires interpretive skills that can discern psychological meaning, assess coherent meanings even across different

expressions and discern the similarities in apparently diverse expressions. An ability to see relationships among psychological phenomena is a requisite skill (1997, p.59). According to Ratner, "Qualitative methodology brings the subjectivity of the researcher to bear on the subjectivity of the subject. It does not attempt to truncate the subjectivity of both parties within formal measurement operations" (p.59).

The process of interpretation in qualitative inquiry is known as hermeneutics. The most important guiding principle of hermeneutics is that psychological significance can only be assumed by looking at the relationships of psychological expressions with other psychological responses. "The significance of a response is not transparent in a single behaviour. It can only be disclosed in a network of responses" (Ratner, p.62). Finding relationships between behaviours in order to illuminate psychological phenomena is known as the hermeneutic circle.

Qualitative research is known by many different names, for example, naturalistic inquiry, constructivist, and interpretive research. However, all these different types of qualitative research have in common their post-positivist (Lincoln & Guba, 1985) or, to use a different term, non-positivist (Ratner, 1997) stance with regard to inquiry. The principles that underlay post-positivist research are the following:

- There are multiple realities. These realities are constructed. Prediction and control of phenomena are not the kind of outcomes sought. Rather, a level of understanding can be achieved through the research.

- There is an interactive relationship between researcher and researched.

- Hypotheses are time and context bound and can therefore not be stated *a-priori*. Qualitative researchers also do not seek to offer generalizations. The aim is to develop an understanding of a particular case.

- All entities are in a constant state of flux that makes it impossible to distinguish causes from effects.

- Post-positivistic research is underpinned by values, that is, it cannot be neutral or value-free.

(Lincoln & Guba, 1985).

3.1 Values underpinning this study

I have positioned my research within the sociocultural paradigm. Thus I acknowledge the interrelatedness of different levels of analysis and the importance of seeing my work within its sociohistorical context. Sociocultural psychological inquiry is in the main interpretive. Within an interpretive framework knowledge is seen as relative and constituted within the frameworks of the paradigm rather than absolute.

My research was underpinned by an understanding that actions and activities are framed by the context within which they occur. This context includes the history of the community of practice to which the participants in the community who are the subjects of the inquiry, belong. My task as a researcher was "to understand what is going on, the *definition of the situation*" (Connole, 1998). Connole states that understanding is the process of interpretation. The researcher aims to understand a phenomenon and is thus able to identify patterns of meaning from which it may be possible to generalize (1998, p.20).

Within the interpretive paradigm knowledge is viewed as constructed, rather than as an independent entity that exists outside of the interactions. According to Lincoln & Guba (1985) constructivism "intends neither to predict and control the 'real' world, nor to transform it, but to *reconstruct* the 'world' at the very point at which it exists: in the mind of the constructor".

3.2 Relationship between researcher and researched

In qualitative research the researcher rarely stands within an independent relationship to the researched. I would thus like to spell out my position in relation to this research. I have been involved in coordinating the Supplemental Instruction (SI) programme at Rhodes University since its inception at this institution in 1994. My tasks as coordinator include recruiting leaders (in partnership with the departments within which they work), training and supervising them. I am involved in clinical supervision of SI sessions with the aim of commenting on the processes I observe so that SI leaders can improve their practice. I often do these observations as a participant observer. This is so that I can participate in the process should it be necessary. Instances of participation occur when I feel it necessary to ask questions, for example, prompting the SI leader and the group to look at different possibilities or if the interactions are shallow and there are possibilities for deeper engagement. The SI leaders and their students are thus used to my presence in SI sessions. For this research the only unusual presence was that of the video camera.

4. The study

4.1 Context of the study - SI at Rhodes University

SI was introduced to Rhodes University in Grahamstown 1994. It was first introduced into the Departments of Law and Psychology. Other departments in the Faculty of Humanities followed. Through the years it has become evident that the programme is most successful in departments with large classes and where the work is conceptually challenging.

SI leaders are chosen jointly by the department and the SI coordinator who is employed by the Academic Development Centre. The training of SI leaders follows broadly the training programme set out by the initiators of SI at the University of Missouri, Kansas City (1995) but has been contextualised for the South African and the Rhodes University context.

SI leaders find it challenging to get all students actively involved in the teaching-learning process in SI sessions as will be seen from the data. Much of this difficulty stems from the educational history of students. However, students from a range of backgrounds report that they find SI beneficial and cite SI as a positive influence in their academic success (Davies & Vorster, 1994).

4.2 Activity as the unit of analysis for this study

In sociocultural research the unit of analysis is activity. According to Rogoff *et al* (1995), Leont'ev was concerned that researchers find a unit of analysis "that preserves the inner

workings of events of interest, rather than separating an event into elements that no longer function as does the living unit" (p.127). For Rogoff *et al* the sociocultural approach involves the observation of processes of development on three planes, the personal, interpersonal and community. However, depending on the research question, one plane will be foregrounded and sense can be made of each plane of analysis within the context of the whole.

For my research, the plane of interest is the interpersonal. I investigate how cognitive development (learning) is mediated within the context of voluntary, small group collaborative work between students. Rogoff *et al* (1995) assert that individuals develop as a result of their involvement with others in shared activity. Their participation in the activities as well as the activities *per se*, constitute and have been constituted by the traditions of the community.

Thus, important research questions that emerge within this framework are: Under what circumstances might social interaction result in learning? Thinking occurs as people participate in an activity. How do people's participation change as an activity develops? Variation and similarity in their participation in varying activities become the focus.

4.2.1 The structure of activity in SI

An SI session can be seen as a context within which some of the regular activities of the academy are exercised. The teaching and learning activities in SI where a near peer (the SIL) and peers (the first year students) are the main actors, include asking and answering questions, solving problems, developing hypotheses and so on. The goals of SI are, amongst others, to provide students with opportunities to learn the course content and strategies for managing

73

and mastering course content within a non-threatening, peer collaborative environment. Thus SI students have opportunities to "engage in social practices which provide frameworks for what are appropriate goals for thinking; opportunities to practice ways of thinking; and tools or the means for thought" (Gilbert, 1995). SI sessions differ from tutorials because the agendas of the participating students rather than those of the lecturer are discussed in the session. Thus the nature of the SI session sets certain boundary conditions for the activities that take place in it.

SI sessions normally have a main task or tasks that can be broken down into many different subtasks that emanate from the main task(s). These subtasks may be initiated by the SIL or by one of the members of the SI group with the goal of developing understanding of the leading activity. Thus the actions are performed with the aim of fulfilling the goals of the activity. The actions in the case of SI are mainly inter-actions between participants. Interactions are similar to Leont'ev's (1981) actions. Following Van Vlaenderen (1997), I have chosen to call them interactions because of the interactive nature of the actions. Each participant's interactions are influenced by the actions or interactions of the other participants as well as the goals and circumstances of the contributions of other participants (Rogoff, 1990).

An interaction refers to an utterance of a participant which is delineated by an utterance of another participant preceding and following it. An interaction can be further divided into operations. In the case of the interactions in SI an operation refers to part of an interaction whose goal and content differs from an operation that precedes and follows it. The goals of the operations can be assessed within the context of the overall goals of the interactions and

conversation of the SI session as a whole. It is recognised that activities are dynamic and that they change with the participants as the goals of their actions or interactions change.

Figure 1 contains a graphic representation of the structure of activity in SI. The manner in which this structure was used to analyse the SI activities will be discussed in the sections that follow.

Figure 1- Structure of the SI activity
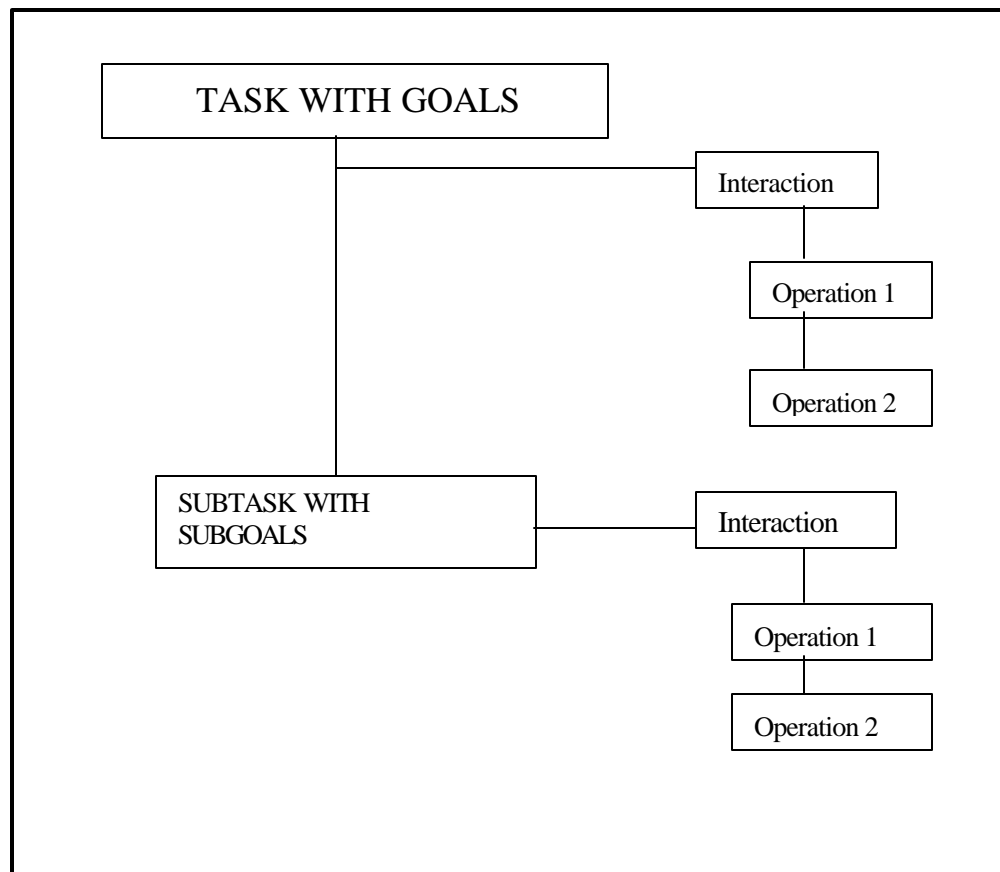
4.3 The research process

I set out to investigate the interactions within SI groups that would generate learning moments. A learning moment occurs when questions relevant to the learners' needs are generated or answered. I was particularly interested in moments where peers collaborate to answer a question or solve a problem. Examples of peer collaboration I have noticed when observing SI sessions include clarifying concepts, processes or procedures and offering strategic help. Another example is when students clarify metacognitive or epistemic issues for themselves or each other. I was interested to see how these peer collaborative processes occur and under what circumstances they emerged, as well as what influenced the quality of these processes.

4.3.1 Data collection

The data were collected within a naturalistic setting. Actual SI sessions were videotaped. The decision to do this was underpinned by an understanding that "realities are wholes that cannot be understood in isolation from their context, nor can they be fragmented for separate study of the parts" (Lincoln & Guba, 1985, p.39). The whole context, including the physical surroundings and the seating plan influence the quality of the inter-actions.

Several SI sessions in Legal Theory 1 and Psychology 1 were videotaped during the second semesters of 1996 and 1997. This time of year was chosen as it was thought that SI leaders would have gained experience from running sessions during the first semester. There was also an assumption that they would have developed more or less stable groups whose members

would be familiar with the SI process. As will be seen from the discussion of the data later, this was not true in all cases.

SI sessions in Legal Theory and Psychology were chosen as SI had been running in those departments since its inception at Rhodes University in 1994. It was assumed that a culture of SI would have developed in those departments and that the type of SI sessions would be a fair reflection of what SI could be like. Logistics like the availability of video equipment and camerapersons influenced when taping could occur.

Students' permission to participate in the research and for the videotaping of their SI sessions was sought before the commencement of taping. Should anyone have objected, the videotaping would not have gone ahead. No one objected at any of the sessions. It is acknowledged that, at the start of an SI session students may have been aware of the camera, but this did not seem to be a problem and sessions proceeded as they would normally have done (This was confirmed through personal communications with SI leaders and students subsequent to videotaping.)

4.3.2 The sampling process

The principle of purposive or theoretical sampling was used to make the final selection of SI sessions for analysis. Out of a pool of recorded SI sessions, a limited number of complete sessions were selected. All the sessions in which the SI leader did not work as a group were excluded. Sessions with only a few students or where the SI leader divided the big group into smaller buzz groups were discarded as that kind of group process has a completely different

dynamic and different mediation means come into play. I chose three SI sessions in which the SI leader worked with the whole group at once. The strategy of choice then, was whole group problem-solving as opposed to, for example, working in pairs or in a number of small groups within the bigger group.

Included in the sample, was what one could regard as a good SI session, a satisfactory one and a particularly poor one. An SI session may be regarded as successful or good if there was a relatively high level of active participation by students in the process of solving the SI task. A poor SI session is one that is dominated by the SIL and where the potential for active learning by the students was either not created or the opportunities for active learning were not utilised during the session. The sampling thus allowed me to do a comparative study of the SI sessions and to draw conclusions on the conditions under which the SI process may be successful or unsuccessful. Thus two Psychology sessions (1996 and 1997) and one Legal Theory session (1997) were chosen.

4.4 Video as data

The videotapes were watched several times, initially with the aim of becoming familiar with the data and, later, to assess whether any patterns emerged. The tapes were transcribed and later the transcriptions were checked by an independent person against the originals for accuracy.

I then proceeded to work with the transcripts. The final analysis was based on the transcripts of the original videotapes with occasional reference to the original tapes for clarification. The

analysis took place against the background of cognitive development theories and collaborative learning theory discussed in chapters 2 and 3 as well as a forestructure developed as a result of my familiarity with the SI process through repeated observations over a number of years.

I was interested in establishing how the interactions during the different task segments were mediated to enable student learning. The different factors that emerged as relevant to my research question were related to the role of the SI leader, the role of the students and the influence of the task.

5. Data Analysis

The data analysis process I followed was adapted from work done by Craig (1988b), Van der Riet (1993) and Van Vlaenderen (1997). The analysis can be divided into roughly six steps. I shall describe in some detail how the analysis proceeded.

5.1 Step one: viewing the tapes

In order to familiarise myself with the data and start the process of immersion in the data, all the videotapes (nine SI sessions) were watched. Familiarity with the range of interaction patterns contained in the tapes allowed me to choose a sample that I felt would allow me to make a useful analysis of important aspects of peer collaborative learning in higher education. Once the sample of three sessions was chosen the three tapes were watched several times. This allowed me to develop a picture of the data (Craig, 1988b). Ideas and questions about the

data began to form at this stage. Craig calls this a "first order imposition of meaning on the data" (1988b, p.98). At this stage and at every other stage of the data analysis the substantive theories about learning in general and collaborative learning in particular as well as the forestructure of my experience as coordinator shaped the meanings imposed on the questions asked.

5.2 Step two: reviewing of the tapes

As I viewed the tapes some tentative answers about the meaning of the data began to emerge. I paid particular attention to the relationship between verbal and non-verbal interactions. Following Craig's suggestion for this early stage of the analysis, the answer to the question of what the data might mean and what the relationship between verbal and non-verbal interactions could be, was answered with the tentative phrase of "I think it means that…". At this point I also began to isolate segments of the tape that seemed to contain potentially rich material for interpretation. These were segments in which the interactions between SI leader and students or between the students themselves, seemed to produce learning moments. Craig (1988b) likened the second stage to a further penetration into the data.

At this stage my supervisor joined me in the viewing of the tapes and together we isolated what might be the units of analysis for this research. Before the third stage of the analysis the videotaped sessions were transcribed and, where appropriate, para-linguistic elements were noted. This was a verbatim transcription. The transcripts were checked with the help of a research assistant.

5.3 Step three: becoming familiar with the transcripts

The next step was to familiarise myself with the transcripts. I found that with the audio-visual pre-analysis in my head, I could proceed with the analysis through examining the transcripts. I used the transcripts to isolate the units of analysis. The units of analysis for this study are the tasks and the actions within tasks. The tasks and actions were fractured into their constituent parts, namely interactions and operations. I shall outline the process of fracturing in another section below.

5.3.1   Step four: developing a thick description of the data

The next stage of the analysis was to develop a thick description of the units of analysis. The development of the thick description occurred through imposing meaning on the data. I began to note patterns of interaction and the variations and similarities as the activities developed were noted (Rogoff, *et al*, 1993).

According to Craig "the data reveals (and may even conceal) the potential story that the researcher constructs." She notes that "the analyst, like the archaeologist, draws on theory and data and the relation between these … in order to construct a coherent account" (p.100).

A thick description answers questions about what the data might mean, what intentions may have been behind the actions and interactions, what the context and goals of actions were, as well as what the underlying or "associated practices, beliefs, desires, etc. surrounding the action" could be (Craig, 1988b, p.100). At this stage, according to Craig, the interpretation

contains "speculation about intentions and possible consequences of this, propositions about the meaning of actions and evaluations of appropriate goals in such a situation" (Craig, 1988b, p.100). This interpretation was guided by the substantive theories that inform my thinking about learning.

Figure 2 is an extract from the first SI session to illustrate the data that emerged from developing a thick description through the process of brainstorming. The first column contains the identification of the speaker. SIL1 indicates that this extract is from the first session where the SI leader has been designated the code SIL1. The SI leaders in the subsequent sessions are identified as SIL2 and SIL3 respectively. S1 refers to the first student to speak. All subsequent interactions by this particular student will be under the designation S1. Subsequent student speakers are indicated by the codes S2, S3, and so forth.

The second column contains the transcribed data. The third column contains the number given to the interactions and operations. For example: SIL1's first *interaction* is sub-divided into three distinct operations. The first operation is denoted by the number 1. Subsequent operations are indicated as following the first operation, i.e. 1.1, 1.2, etc. An explanation of the terms interaction and *operation* follow in Section 5.4.   The fourth column contains the thick description of the data.

Figure 2 – Thick description of extract from SI session

SIL1	Let's review the facts we drew together last week.	1	- SIL1 bring the group to order to start the session. - SIL1 invites contributions from the group. - SIL1 also wants to bring people who did not attend the previous week, into the picture. - SIL1 wants the group to get a picture of where they got to the previous week.
	Okay, who wants to start?	1.1	- SIL1 opens the floor to the group. - SIL1 invites participation. - SIL1 offers the group the choice to participate.
	S1, do you want to start?	1.2	- SIL1 notices that S1 is ready to start. - SIL1 asks him if he would like to start.
S1	We defined *delict*. Then we went to the elements of *delict*. … … interpretation.	2	S1 lists what they did the previous session.
SIL1	Does everybody understand the path that we followed?	3	- SIL1 asks if everyone understands the path they've been following. - SIL1 reminds them that they are working within a structure.

5.4   Step five: fracturing the data

The next step was to code the different sub-units of analysis so that I could provide an explanatory account of the data. The coding was guided by the methodology developed by Van Vlaenderen (1997). Van Vlaenderen did an analysis of group problem-solving workshops where the participants were community activists. Her aim was to analyse the process of

problem-solving through an everyday cognition approach. Her analysis of the process seemed appropriate to the process of peer collaboration in SI sessions.

Following Van Vlaenderen (1997) I isolated the *interactions* between participants. An interaction is one instance of communication by one participant that is preceded and followed by input from another participant (See section 4.2.1). Each interaction was further divided into what she terms *operations*. An operation is the smallest unit of meaning that can be isolated within the interaction and that can be differentiated from other meaning units within the interaction. An operation gets its meaning from its purpose in terms of the collaborative process and relates to the communication between participants and its function within the context of the task being addressed and the SI session as a whole. Figure 2 shows how the first interaction by SIL1 was fractured into its constituent operations.

5.5 Step six: the development and application of a reading guide

The fractured data were then analysed using a reading guide. Van Vlaenderen (1997) asserts that "a reading guide method of textual interpretation aims at extricating those features of texts which clarify the meaning of a text." (p.92) Van Vlaenderen (1997) makes the point that the reading guide is based on the assumption that the process of interpretation is "a reflective process of engaging data guided by successively revised and better formulated questions". The questions are developed through an earlier process of data analysis and when imposed on the data, it allows the data to be read through a sharper lens than the previous analysis through which the guide was created.

84

The reading guide developed by Van Vlaenderen (1997) isolated three elements as the constituent parts of the operations or interactions. These elements are the *immediate interaction function (IF)*, the *cognitive-affective content (C)* and the *underlying function (UF)* of the operations. They relate to the function of the interaction in terms of the session as a whole, or the task being worked on in particular. The IF relates to the function of the operation in relation to the conversation happening in the session. The C relates to the cognitive purpose and / or affective content of the operation in relation to the promotion of understanding or the learning goal of the task or sub-task. The UF has to do with how the operation relates to the task the group is busy with at the time of the operation or in relation to the SI session as a whole. Each element occurs in several different forms.

The reading guide is applied by asking the following question about each operation, "*What does this interaction or operation mean in relation to what has gone before – utterances as well as tasks?*" I adapted the reading guide to suit the context of peer collaborative learning. Thus some of the original forms of the elements were maintained while others were eliminated and still others added. The new reading guide was refined through the process of attempting to apply it to the data. Successive applications of the reading guide revealed ways in which the guide needed to be adapted or refined. After each adaptation of the guide, the new guide was applied to all the data. Thus the data underwent successive reinterpretations as Reading Guide 1 was refined.

When the Reading Guide 1 was finalised, an independent coder did a blind coding of the transcriptions plus thick descriptions of the three sessions. After each session was coded, we compared her coding to mine. Most of the coding was the same. However, there were a few

differences of interpretation. In cases of difference, we talked about our different interpretations with the aim of settling on one consensus interpretation. The categories that were sometimes problematic pertained to the following interactive functions: *comment, elaborate* and *explain*; forms of cognitive affective content that presented intermittent problems were *interpretation* and *reflection* and sometimes it was difficult to distinguish between *interpretation* and *example* as an interpretation would sometimes consist of presenting examples; the underlying functions that presented interpretation differences were: *task* and *group*. It was difficult in some instances to differentiate whether an utterance was task related or group related. The distinction between a *contribution* and an utterance specifically aimed at *developing conceptual understanding* was problematic at times. The reading guide is not perfect, but represents a "best fit" in terms of the data and the interpretations available.

The different forms of the three elements used in my analysis are presented in Table 2. A breakdown of the meanings of each of the forms of the elements is presented in Appendix A:

Table 2 - Elements and their forms

Immediate interactive function (IF)	Cognitive-affective content (C)	Underlying function (UF)
clarify	example	task
comment	fact	Develop conceptual understanding
inform	interpretation	amplify
question	reflection	participation
invite	understand	contribution
justify	repetition	direction
elaborate	strategy	own needs
probe	concept	engagement
explain	class memory	group
query	puzzle	concept clarification
request	problem	intersubjectivity
request assistance		light relief
record		
disagree		
suggest		

An example of the application of Reading Guide 1 to the data is presented in Figure 3. Note that the first couple of operations represent the first interaction by SIL1. The interaction was thus divided into its constituent parts in terms of the operations it was made up of. All operations always have an IF and UF, but in some cases it was not possible to assign a cognitive/affective content to the operation.

Figure 3 – Reading Guide 1 applied to extract from Session 1.

SIL1 1	Let's review the facts we drew together last week.	1	• SIL1 bring the group to order to start the session. • SIL1 invites contributions from the group. • SIL1 also wants to bring people who did not attend the previous week, into the picture. • SIL1 wants the group to get a picture of where they got to the previous week.	IF: Invite C: -- UF: Task
	Okay, who wants to start?	1.1	• SIL1 opens the floor to the group. • SIL1 invites participation. • SIL1 offers the group the choice to participate.	IF: Invite C: -- UF: Participation
	T, do you want to start?	1.2	• SIL1 notices that T is ready to start. • SIL1 asks him if he would like to start.	IF: Invite C: -- UF: Participation
S1	We defined *delict*. Then we went to the elements of *delict*. … … interpretation.	2	• SI lists what they did the previous session.	IF: Inform C: Fact UF: Contribution
SIL1 1	Does everybody understand the path that we followed?	3	• SIL1 asks if everyone understands the path they've been following. • SIL1 reminds them that they are working within a structure.	IF: Question C: -- UF: Intersubjectivity

The analysis of the fractured data was processed by means of a computer spreadsheet programme. The data were quantified and summary tables of contributions by the different participants were developed. In addition, bar graphs that facilitate comparisons of contributions were produced for each session. The quantified data were used to develop interpretations about the quality of interactions in SI. The results of the analysis of the data achieved through the application of the Reading Guide 1 are presented in Chapter Five.

5.6 Application of a second reading guide

A second reading guide was applied to the original videotaped data, the transcribed sessions, the thick description, and the data accessed through the Reading Guide 1. Reading Guide 2 related specifically to the process of mediation in SI.

With regard to the SI leader the following questions emerged: How does the leader manage the group? What strategies does he/she use and how do the strategies enable or hinder collaborative learning?

With regard to the role of the students, the questions were the following: How do the students interact with each other and with the SI leader? What kinds of interaction patterns emerge and which elements within the SI session influence the patterns of interaction?

In relation to the task, the questions that emerged were: What is the nature of the tasks employed in these SI sessions? Do they stimulate active, collaborative learning? Do different types of tasks lead to different interaction patterns and different learning outcomes?

The results of the application of the Reading Guide 2 are presented in Chapter Six.

6. Validity

There are a variety of viewpoints about how qualitative researchers can ensure the validity of their research. Lincoln & Guba (1985) believe that the criteria for trustworthiness within the

naturalistic paradigm need to be different to those traditionally used for positivistic research. They argue that the naturalistic epistemology is better served through an interrogation of the credibility (instead of internal validity), dependability (instead of reliability), and confirmability (instead of objectivity). They suggest that the following methods are used to ensure trustworthiness of qualitative research: "prolonged engagement and persistent observation, triangulation, peer debriefing, negative case analysis, and member checking (to establish credibility); thick description (to facilitate transferability); and auditing, to establish dependability and confirmability (p.219).

In this study an independent researcher coded the transcripts blindly using the first reading guide to ensure the trustworthiness of the interpretations. I have also developed thick descriptions of the data. My prolonged involvement in clinical observations also contributed to the trustworthiness of the interpretations.

Ratner (1997) argues for the use of Maxwell's (1992) criteria for validity and reliability measures. Maxwell suggests that the following measures are most suited to qualitative research methodology: descriptive validity, interpretive validity, theoretical validity, generalizability and where relevant, evaluative reliability.

Descriptive validity refers to the factual accuracy of the research account. The researcher needs to take measures to ensure that what she is describing did in fact occur, was seen and heard. All other validity measures are dependent on the establishment of descriptive validity. He asserts that descriptive validity is concerned with issues of omission and commission. "The omission of things that participants in the discussion feel are significant to the account

(for the purposes at issue) threatens the descriptive validity of that account" (p.287). Verification by different observers could facilitate descriptive validity. In this research, an independent researcher verified the transcripts.

6.1 Interpretive validity

For qualitative researchers, the *meaning* of objects, events and behaviours are paramount. Interpretive validity is not at issue in positivistic research. According to Maxwell, "accounts of participants' meanings are never a matter of direct access, but are always *constructed* by the researcher(s) on the basis of accounts and evidence". I would suggest that in the study contained in this dissertation, independent observer verification could be an adequate measure of interpretive validity as my concern is not with participants' assessment of their experiences, as would be the case in a phenomenological account. Thus seeking consensus would be adequate for both descriptive and interpretive validity (p.291).

6.2 Theoretical validity

Maxwell argues that abstraction of data "goes beyond concrete description and interpretation and explicitly addresses the theoretical constructions that the researchers bring to or develop during the study" (p.291). Theoretical understanding refers to an understanding of how the account functions as an explanation of the phenomena under scrutiny as well as how the account functions as a description and interpretation of that phenomenon. Thus the validity of the concepts as well as the suggested relationships between them need to be considered. This relates to what is commonly known as construct validity and internal or causal validity.

Maxwell suggests that consensus about the meanings of terms, and the appropriateness of their applications is sought. He states that "any challenge to the meaning of terms, or the appropriateness of their application to a given phenomenon, shifts the validity issue from descriptive or interpretive to theoretical".

6.3 Generalizability

Maxwell mentions two types of generalizability: generalising within a community where the findings in one case study are applicable to other cases within the same setting and generalising to settings beyond the one studied. For Maxwell "internal generalizability … is far more important because qualitative researchers rarely make explicit claims about the external generalizability of their accounts".

6.4 Evaluative validity

Like generalizability, evaluative validity is not an important factor in qualitative research and certainly falls beyond the scope of this study.

7. Ethical considerations

The students in the selected SI groups were approached to participate in the research. Permission was sought from these students to videotape their SI sessions. Care was taken not to reveal the identities of any students or SI leaders involved in this study. They are referred to

as SIL (SI leader) 1, 2 or 3. Similarly, students are identified as S1, S2, etc. in order of their active participation in a session.

8. Conclusion

In this chapter I have outlined the main considerations pertaining to this study. In accordance with issues of validity in qualitative research, I have endeavoured to provide a description of the theoretical and paradigmatic values that underpin this study. I have also outlined the issues that are considered important in terms of establishing the trustworthiness of this study. In the next chapter the research findings are presented.

CHAPTER FIVE

THE DATA – INTERACTION PATTERNS

1. Introduction

In this chapter and in Chapter Six I present the data from my research. In the present chapter, the analysis of the activity in the SI sessions is presented. The theoretical underpinnings for this analysis of activity were discussed in Section 2 of Chapter Two and Sections 4.2 and 4.3 of Chapter Four. The data for the analysis in this chapter will be presented in Section 2 below. In Chapter Six I present data to illustrate the mediation patterns that emerge in the three SI sessions. The data for this analysis of mediation patterns were the transcripts of and the raw data from the video-tapes of the sessions. The data analysis in Chapters Five and Six will then be used to draw conclusions about the process of peer collaboration in the three SI sessions under investigation, in Chapter Seven.

2. Database and summary data

In this section the process of the generation of the database for the analysis of interactions and operations is discussed and examples of the database will be presented. The raw data from which the database was generated were the transcripts from the three sessions read in conjunction with the videotapes wherever additional information was pertinent. Summary data were generated from the database and a large part of the discussion in this chapter is based on these summaries.

2.1 The generation of the database

The research was an investigation of the activity, that is the interactions and operations in the SI sessions. The structure of the SI activity that influenced the analysis was the following: The SI session was the first, broad unit of analysis. The participants in the SI activity, the SIL and the first year students participated in the teaching-learning process through interactions. An interaction is an utterance of one participant which is delineated by an utterance from another participant before and after. In many instances, an interaction could be divided into two or more operations. One operation can be separated from another through its goal / motive in relation to other operations, the task or sub-task. (See also, Sections 4.2.1 and 5.4 in Chapter Four for more in-depth description of this analysis).

The data for this analysis were derived from transcribing the raw data from the videotaped SI sessions. A thick description was imposed on the data. The next step was to fracture the data into interactions and operations. Finally, Reading Guide 1 was applied to the fractured data in order to facilitate the analysis of the activity (see Section 5.5 in Chapter Four for a discussion of Reading Guide 1).

Reading Guide 1 allowed me to analyse each operation in terms of the following elements: its immediate interactive function (IF) (that is, how it related to the previous operation or interaction), the cognitive-affective content (C) of the interaction (how it aimed to further understanding, or the affective content of the operation); and the underlying function (UF), that is, how the operation related to the task or the session as a whole. Each element could

take several forms. Table 2, which provides a breakdown of the three elements and their different forms, is reproduced below.

Table 2 – Elements and their forms

Immediate interactive function (IF)	Cognitive-affective content (C)	Underlying function (UF)
clarify	example	task
comment	fact	develop conceptual understanding
inform	interpretation	amplify
question	reflection	participation
invite	understand	contribution
justify	repetition	direction
elaborate	strategy	own needs
probe	concept	engagement
explain	class memory	group
query	puzzle	concept clarification
request	problem	intersubjectivity
request assistance		light relief
record		
disagree		
suggest		

2.2 The structure of the database

The activity structure of each SI session is represented in the database. The database contains the consecutive operations that make up each session. An extract from the database for demonstration purposes is given in Figure 4. The operations are colour coded. Each figure consists of six columns: the first indicates the number of the operation, the second identifies the participant of the interactions and operations, the third indicates the form of the IF, the fourth indicates the form of the C and the fifth indicates the form of the UF within the

operation. The sixth column is an annotated sub-division of the session into different stages. A stage is regarded as a part of the session that can be isolated from other parts of the session in terms of its task, that is, the issues or combination of issues dealt with during the stage. Each stage denotes a change or development in the goal of the activity and thus initiates a new task or sub-task for the group. The stages were isolated as a result of interpretations of the raw data and the graphical representation.

Figure 4 – Extract from database from Session 1.

54	SIL	Question	Understand	Task	**Stage 8:** SIL1 negotiates sub-task 4. The task is established. SIL1 inquires whether the concept under discussion is understood. Understanding of concept clarified.
54.1	SIL	Suggest		Task	
55	S3	Comment	Fact	Direction	
55.1	S3	Inform	Class memory	Contribution	
56	SIL	Question		Task	
57	S2	Suggest		Contribution	
58	S3	Elaborate	Fact	Contribution	
59	SIL	Question	Understand	Task	
60	S3	Inform	Fact	Task	
61	SIL	Question		Participation	
62	S5	Inform	Reflection	Task	
63	SIL	Invite		Participation	
63.1	SIL	Request	Puzzle	Engagement	
64	S5	Inform	Fact	Task	
65	SIL	Request		Participation	
66	S6	Inform	Example	Contribution	
67	S1	Elaborate	Class memory	Contribution	
68	S2	Inform	Fact	Contribution	
68.1	S2	Comment	Interpretation	Task	
68.2	S2	Question	Strategy	Task	**Stage 9:** S2 initiates sub-task 5. She wants to clarify an epistemic issue. Her problem is resolved.
69	SIL	Question	Puzzle	Task	
70	S2	Inform	Fact	Contribution	
71	SIL	Question	Puzzle	Task	
72	S3	Inform	Fact	Contribution	
73	S2	Inform	Fact	Contribution	
74	SIL	Support	Repetition	Task	

2.3 Frequency of the different forms of the interaction elements IF, C and UF

The data from analysis were quantified in order to draw comparisons between types and frequency of inputs made by each member of the three sessions. Summaries of the frequencies of the different forms of the elements IF, C and UF are presented below to facilitate the discussion about each session. There will always be the same number of IF and UF in a session. However, the number of C will be less as not all operations had a definite cognitive-affective content.

It is my assertion that certain types of interactions are potentially productive in stimulating peer learning whereas other types of interactions limit the potential for such learning to occur. The quantified data allowed me to see whether there were any sharp distinctions between the three SI sessions. The quantified data are represented graphically in tables and also in the form of bar graphs for ease of reading. The graphs were generated by means of the spreadsheet computer programme, Microsoft Excel.

3. Analysis of the sessions

These data are used to draw comparisons between the three sessions in order to form a picture and develop conclusions about the activity patterns and the nature of the tasks in each SI session and how these influence each other and the potential for active learning in each session.

The discussion of the data from each session will start with a brief description of the nature of the overall tasks discussed in the session. This is followed by a discussion of the roles of the students and the SI leaders in the sessions. A more extensive discussion about aspects of the tasks is presented in Chapter Six.

Conclusions about the mediation styles of the SILs can be drawn from the data as well as about the interaction patterns of the students in relation to that of the SILs. The data also reveal information about the potential cognitive benefit of the interactions and tasks the groups participated in. I shall now look at the data from each session in turn. This will be followed by a comparison between the three sessions.

3.1 Session 1

The main aim of the session was to discuss a Legal Theory problem question. A problem question presents a scenario of a legal problem and asks students to analyse the problem and present a judgement about, for example, how they would advise a client under the circumstances presented in the story of the problem. All the inputs and sub-tasks contributed toward the goal of developing an approach to answering the problem question.

Seven students participated in this session. The group sat around a long, rectangular table. SIL1 and S6 and S7 sat on one side of the table, the rest sat opposite them. SIL1 thus faced S1, S2, S3, S4 and S5 throughout the session, but had to turn to his right to make eye contact with S6 and S7.

3.1.1 Student contributions

Session one had the highest rate of participation by students of all three sessions. Together, the students in the session provided more input than the SI leader. Inputs were measured in terms of operations contributed by participants. SIL1 contributed 49.28% while the students contributed 50.72%. Of the students, S2 contributed the most (17.63%), followed by S5 (8.99%), S4 (7.91%), S3 (5.76%) and S1 (5.40%). S6 and S7 provided the least input (less than two percent each of the total contributions by all participants. The frequency of the various forms of the element IF is presented in Table 3 and Figure 5.

This interpretation is based on an analysis of the frequencies of the different forms of the elements of IF, C and UF in relation to the contributions of each participant. The percentages were calculated by dividing the number of contributions of each form of the elements by the total number of contributions by the SIL and the total number of contributions by the students, respectively, in each SI session. Thus, for example, the total number of IF and UF contributed by the SIL in Session 1 was 137 and that contributed by the students was 141. The total number of C was 105 (SIL1) and 125 (students). Percentages were rounded off to the second decimal point.

Note: In the following tables, SS was used to refer to instances where more than one student said the same thing and it was difficult to differentiate between speakers. SX refers to a student who was not within view of the camera at the time of speaking and who could not be identified.

Table 3 - Frequency of the forms of element IF – Session 1

Participant	Clarify	Comment	Disagree	Elaborate	Explain	Inform	Question	Invite	Justify	Probe	Query	Request	Req. Ass.	Suggest	Support	Total Participation	Rate
S1	0	0	1	2	1	6	2	0	0	0	0	0	1	2	0	15	5.40
S2	2	6	4	2	2	19	6	0	2	0	2	0	0	3	1	49	17.63
S3	0	3	0	2	2	8	1	0	0	0	0	0	0	0	0	16	5.76
S4	1	1	0	3	0	9	2	0	0	0	1	1	0	3	1	22	7.91
S5	1	2	1	0	0	11	2	0	2	0	1	0	1	2	2	25	8.99
S6	0	0	0	0	0	4	0	0	0	0	0	0	0	0	1	5	1.80
S7	0	0	0	0	0	1	3	0	0	0	0	0	0	0	1	5	1.80
SS	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	3	1.08
SX	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.36
SIL	16	12	0	3	3	19	34	13	3	9	0	4	0	6	15	137	49.28
Total	20	24	6	12	8	79	51	13	7	9	4	5	2	16	22	278	100.00

Figure 5 - Frequency of the forms of the element IF - Session 1
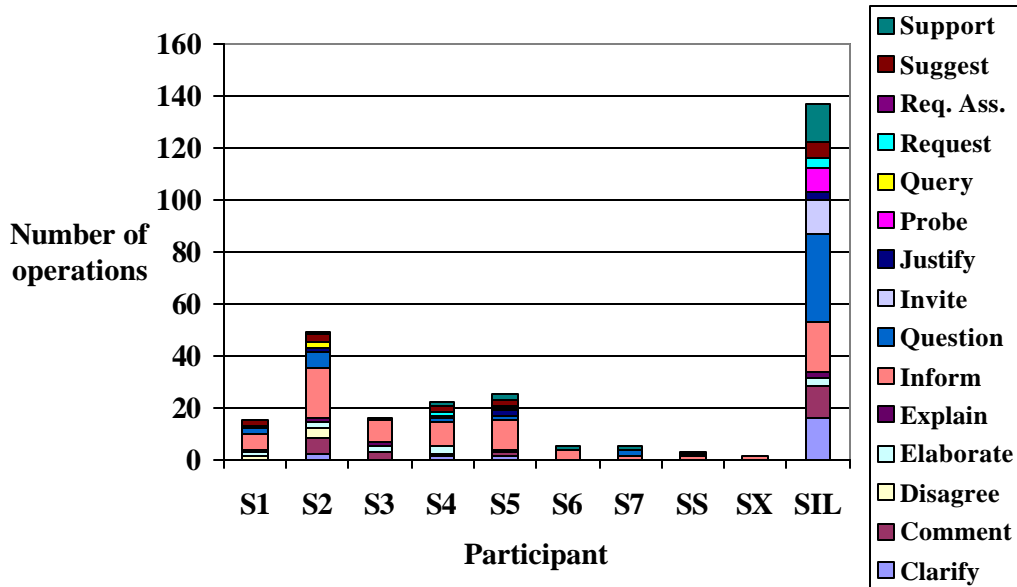
The most frequent forms of the element (IF) contributed by the students were: inform (42.55%), question (12.06%), comment (8.51%), suggest (7.09%), and elaborate (6.38). Other forms of IF occurred less than 5% each. The frequency of the forms of the element C is given in Table 4 and Figure 6.

Table 4 - Frequency of the forms of the element C – Session 1

Participant	Class Memory	Concept	Example	Fact	Interpretation	Opinion	Problem	Puzzle	Reflection	Repetition	Strategy	Understand	Total	Participation Rate
S1	1	0	2	7	0	0	1	1	0	0	1	1	14	6.09
S2	2	0	2	17	7	5	0	2	4	0	2	1	42	18.27
S3	1	1	0	10	1	1	0	0	1	0	0	0	15	6.52
S4	0	1	3	10	2	0	1	1	0	1	0	0	19	8.26
S5	2	0	1	9	3	2	0	0	2	2	1	0	22	9.57
S6	1	0	1	2	0	0	0	0	0	1	0	0	5	2.17
S7	0	0	2	0	0	0	1	1	0	1	0	0	5	2.17
SS	0	0	0	0	0	0	0	1	0	0	0	1	2	0.87
SX	0	0	0	1	0	0	0	0	0	0	0	0	1	0.43
SIL	0	2	8	19	6	4	3	15	9	15	10	14	105	45.65
Total	**7**	**4**	**19**	**75**	**19**	**12**	**6**	**21**	**16**	**20**	**14**	**17**	**230**	**100.00**

Figure 6 - Frequency of the forms of the element C - Session 1
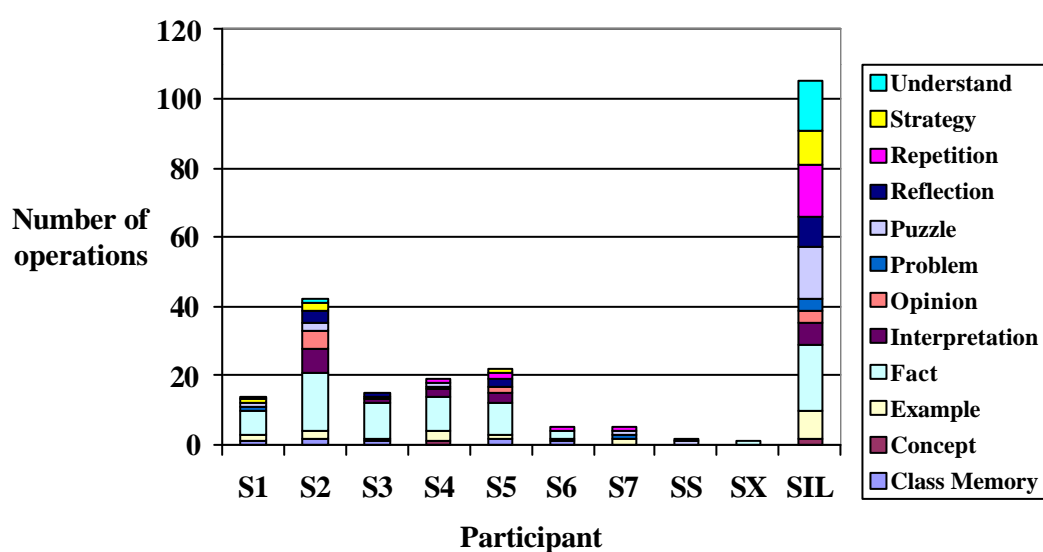
The most frequent forms of the element C contributed by the students were: fact (44.8%) interpretation (10.4%), example (8.8%), opinion (6.4) and class memory and reflection (5.6% each). Other forms of content occurred less than 5% each.

The frequency of the forms of the element UF are given in Table 5 and Figure 7.

Table 5 - Frequency of the forms of element UF – Session 1

Participant	Amplify	Contribution	DCU	Direction	Engagement	Group	Inter-subjectivity	Light Relief	Individual Needs	Participation	Task	Total	Participation Rate
S1	0	10	2	0	0	0	0	1	0	0	2	15	5.40
S2	0	26	6	1	0	1	4	2	0	0	9	49	17.63
S3	0	11	0	1	0	1	1	0	0	0	2	16	5.76
S4	0	13	6	0	0	0	0	0	1	0	2	22	7.91
S5	0	12	6	1	0	0	1	0	0	0	5	25	8.99
S6	0	4	0	0	0	0	0	0	0	0	1	5	1.80
S7	0	2	2	0	0	0	0	0	0	0	1	5	1.80
SS	0	0	0	0	0	0	0	0	0	0	3	3	1.08
SX	0	1	0	0	0	0	0	0	0	0	0	1	0.36
SIL	3	7	35	3	12	9	10	0	0	15	43	137	49.28
Total	**3**	**86**	**57**	**6**	**12**	**11**	**16**	**3**	**1**	**15**	**68**	**278**	**100.00**

Figure 7: Frequency of the forms of the element UF - Session 1
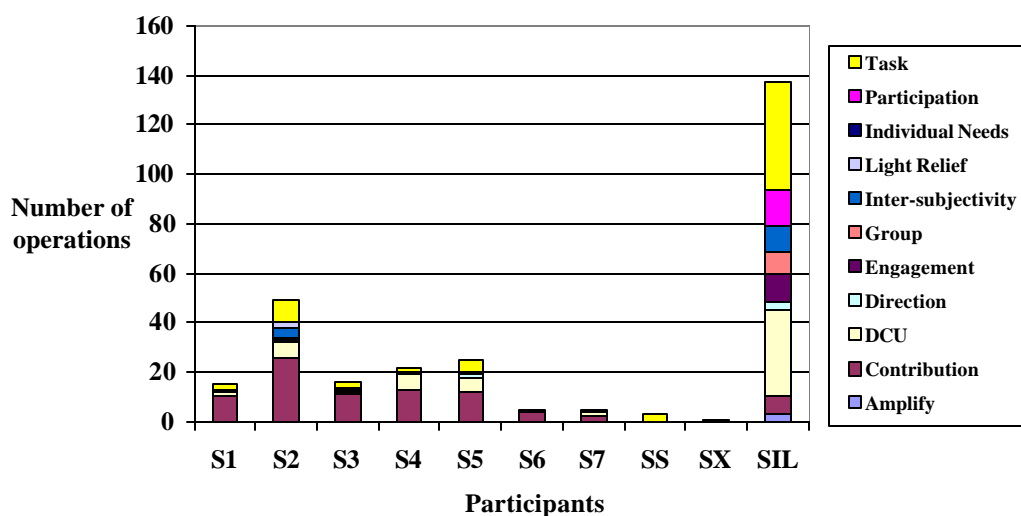
The most frequent forms of underlying function (UF) contributed by students in this session were: contribution (56.03%), task (17.73%), develop conceptual understanding (DCU) (15.60%). Other forms of UF occurred less than 5% each.

Student contributions of the following forms of the elements IF, C and UF exceeded that of SIL 1:

IF: disagree, elaborate, explain, inform, justify, query, request assistance and suggest.

C: class memory, example, fact, interpretation, opinion, and reflection.

UF: contribution, individual needs.

3.1.2 Contributions by SIL1

The most frequent forms of immediate interactive function (IF) contributed by SIL1 were: question (24.82%), inform (13.89%), clarify (11.68%), support (10.95%), invite (9.49%) comment (8.76) each and probe (6.57%). Other forms of IF occurred less frequently than 5% each.

The most frequent forms of content contributed by SIL1 were: fact (18.10%), repetition and puzzle (14.29 % each), understand (13.33%), strategy (9.52%), reflection (8.57%), example (7.62%) and interpretation (5.71%). Other forms of content occurred less frequently than 5% each.

The most frequent forms of underlying function (UF) contributed by SIL1 were: task (31.39%), DCU (25.55%), participation (10.95%), engagement (8.76%), intersubjectivity

(7.30%), group (6.57%), and contribution (5.11%). Other forms of content occurred less frequently than 5% each.

3.2 Session 2

For this session, two students were asked to prepare summaries of sections of the work on a section on *Thought and Language* in the Psychology 1 textbook (Louw & Edwards, 1993). They presented their summaries in the session. Everyone was expected to prepare the section and arrive with questions and issues they needed to clarify.

There were twelve students in the session. They sat in individual desk chairs in the shape of a horseshoe. The SIL2 was positioned in front of the board and acted as scribe to the group. She stood in front of the board throughout the session. Six of the twelve students participated. Apart from the two presenters, S1 and S5, most of the interactions were by S2.

3.2.1 Student contributions

In session 2 most of the interactions were contributed by the SIL2 (60.35%), followed by S1 (15.42%), S2 (11.45%), S5 (5.73%) and S3 (4.85%). S4 and S6 contributed less than one percent to the session. The rest of the students in the group (7) did not contribute. The frequency of the forms of the element IF will be presented in Table 6 and Figure 8.

Table 6 - Frequency of the forms of element IF – Session 2

Participant	Clarify	Comment	Disagree	Elaborate	Explain	Inform	Question	Invite	Justify	Probe	Query	Record	Request	Req. Ass.	Suggest	Support	Total Participation	Rate
S1	0	0	0	2	1	29	1	0	0	0	1	0	0	0	0	1	35	15.42
S2	0	0	1	1	3	10	3	0	1	0	0	0	0	0	4	3	26	11.45
S3	0	0	0	0	1	4	0	0	0	0	0	0	0	2	2	2	11	4.85
S4	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0.88
S5	0	0	0	0	1	7	3	0	0	0	0	0	0	1	1	0	13	5.73
S6	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	0.88
SX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.44
SIL	5	15	1	11	15	10	34	6	1	9	1	8	4	1	10	6	137	60.35
Total	5	15	2	14	21	64	42	6	2	9	2	8	4	4	17	12	227	100.00

Figure 8 - Frequency of the forms of the element IF - Session 2
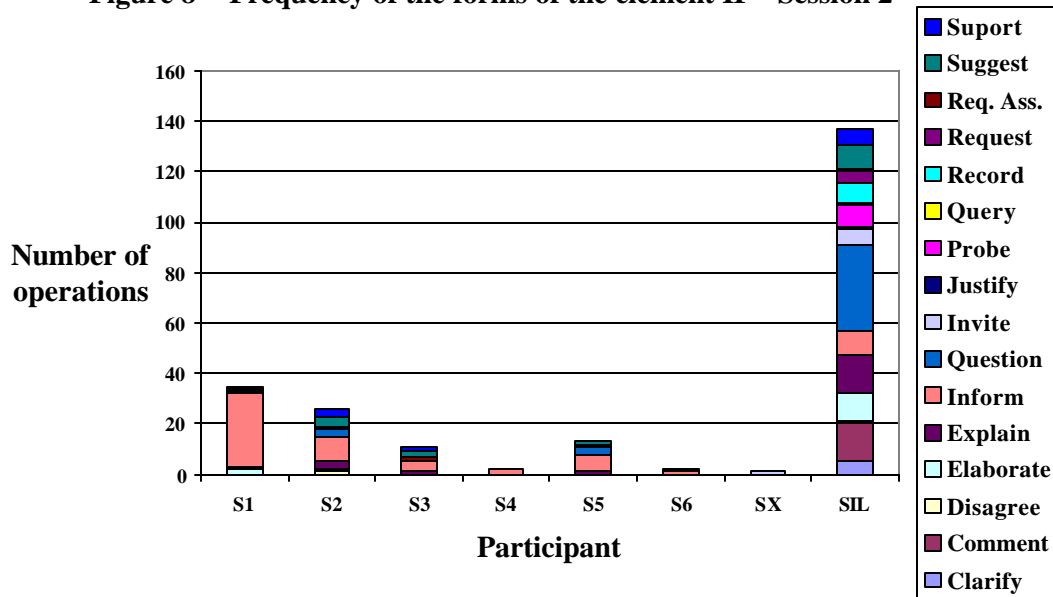
The most frequent forms of IF contributed by the students in this session were: inform (60%), question (8.89%), suggest (7.78%), and explain and support (6.67%). Other forms of IF occurred less than 5% each. The frequency of the forms of the element C will be presented in Table 7 and Figure 9.

Table 7 - Frequency of the forms of element C – Session 2

Participant	Class Memory	Concept	Example	Fact	Interpretation	Opinion	Problem	Puzzle	Reflection	Repetition	Strategy	Understand	Total	Participation Rate
S1	1	1	5	25	1	0	0	0	0	1	0	1	35	18.04
S2	0	0	2	5	9	4	2	0	1	2	0	0	25	12.89
S3	0	0	0	4	2	2	1	0	0	0	0	0	9	4.64
S4	0	0	0	2	0	0	0	0	0	0	0	0	2	1.03
S5	0	0	1	8	1	0	2	0	0	0	0	0	12	6.19
S6	0	0	0	1	0	0	0	1	0	0	0	0	2	1.03
SX	0	0	0	0	0	1	0	0	0	0	0	0	1	0.52
SIL	0	0	8	4	38	1	4	12	6	19	7	9	108	55.67
Total	1	1	16	49	51	8	9	13	7	22	7	10	194	100.00

**Figure 9 - Frequency of the forms of the element C - Session 2**
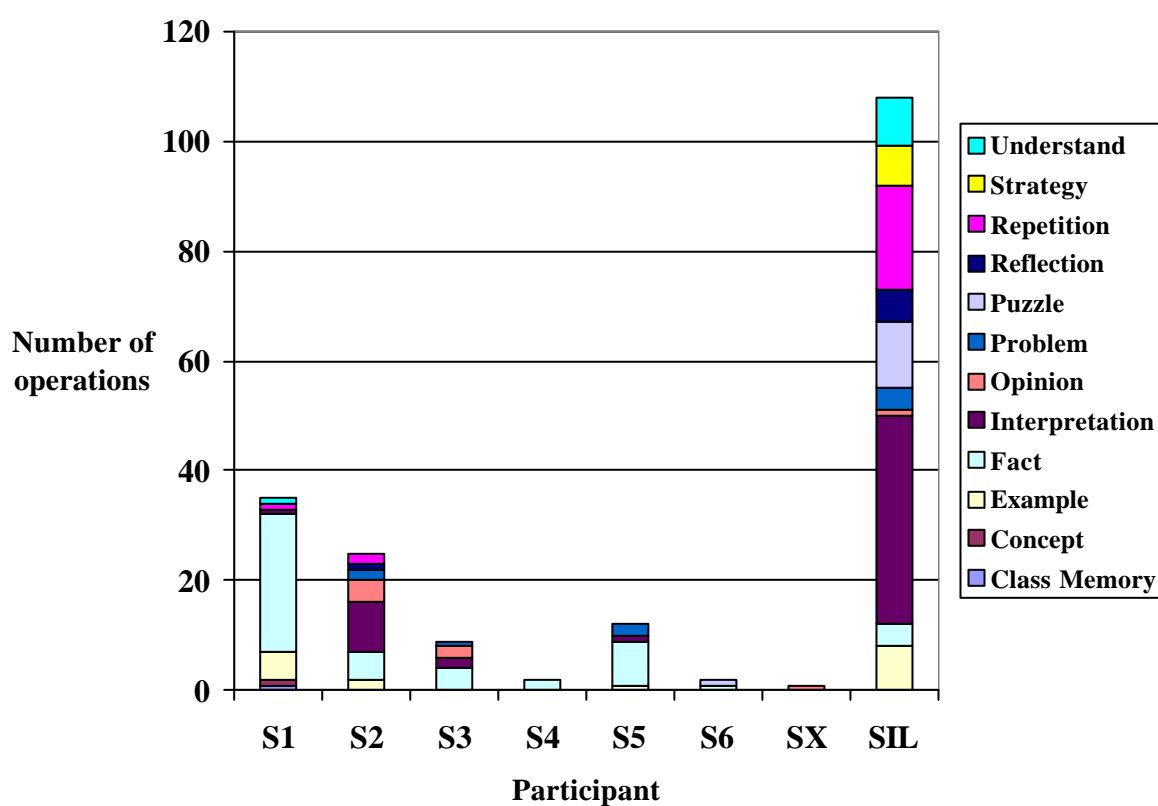
The most frequent forms of content contributed by students were: fact (52.33%), interpretation (15.12%), example (9.3), opinion (8.14%), and problem (5.18). Other forms of content occurred less than 5% each. The frequency of the forms of the element UF will be presented in Table 8 and Figure 10.

Table 8 - Frequency of the forms of element UF – Session 2

Participant	Amplify	Concept Clarification	Contribution	DCU	Direction	Engagement	Group	Inter-subjectivity	Light Relief	Individual Needs	Participation	Task	Total	Participation Rate
S1	0	1	24	4	2	0	0	1	0	0	0	3	35	15.42
S2	1	1	13	9	0	0	0	0	1	0	0	1	26	11.45
S3	0	1	1	6	1	0	0	0	0	0	0	2	11	4.85
S4	0	0	2	0	0	0	0	0	0	0	0	0	2	0.88
S5	0	1	8	4	0	0	0	0	0	0	0	0	13	5.73
S6	0	1	1	0	0	0	0	0	0	0	0	0	2	0.88
SX	0	0	1	0	0	0	0	0	0	0	0	0	1	0.44
SIL	10	9	8	48	5	11	6	5	0	0	11	24	137	60.35
Total	**11**	**14**	**58**	**71**	**8**	**11**	**6**	**6**	**1**	**0**	**11**	**30**	**227**	**100.00**

**Figure 10 - Frequency of the forms of the element UF
- Session 2**
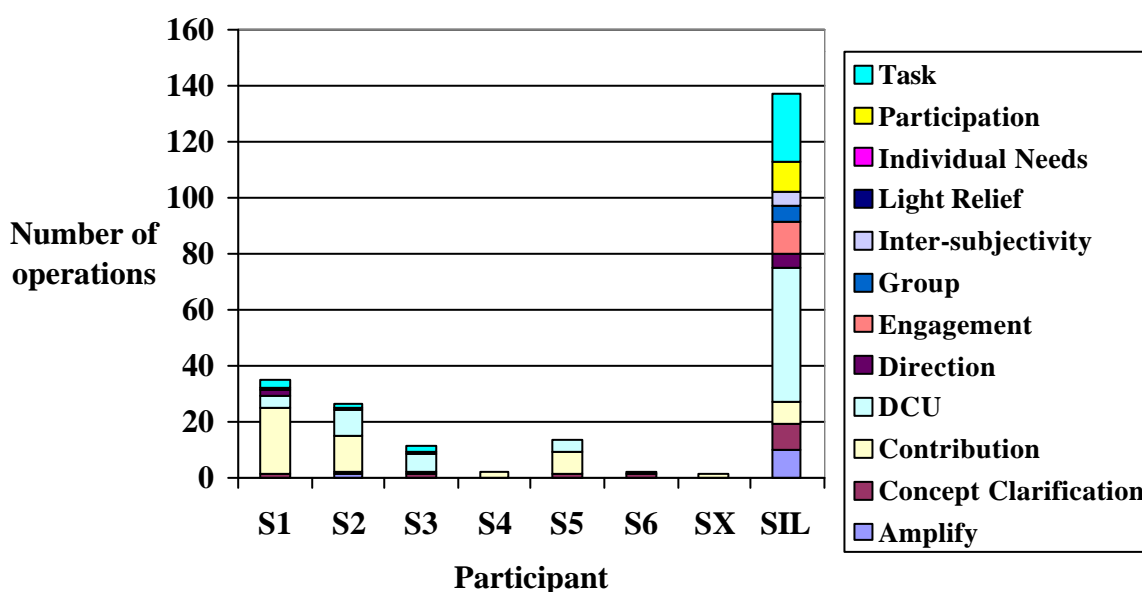
The most frequent forms of UF contributed by students were: contribution (56.03%), DCU (25.56%), task (6.67%) and concept clarification (5.56%). All other forms of UF occurred less than 5% each.

Student contributions of the following forms of the elements IF, C and UF exceeded those made by SIL2:

IF: inform

C: fact, opinion, example and problem

UF: contribution

3.2.2 Contributions by SIL2

The most frequent forms of IF contributed by SIL2 were: question (24.82%), explain and comment (10.95% each), elaborate (8.03%), inform and suggest (7.30% each), probe (6.57%), and record (5.84%). All other forms of IF occurred less than 5% each.

The most frequent forms of content contributed by SIL2 were: interpretation (35.19%), repetition (17.59%), and puzzle (11.11%), understand (8.33%), example (7.41%), strategy (6.49) and reflection (5.56%). All other forms of content occurred less than 5% each.

The most frequent forms of UF contributed by SIL2 were: DCU (36.04%), task (17.52%), engagement and participation (8.03% each) concept clarification (6.57%), amplify (7.30%) and contribution (5.84%). All other forms of UF occurred less than 5% each.

3.3 Session 3

The task in Session 3 was a discussion of a plan for an essay on the implications of studies on intelligence on our understanding of the nature of human intelligence. The second task related to developing an understanding of the different theories of intelligence in order to be able to answer multiple choice questions on the topic.

Seven students were present at this SI session. The students and SIL3 were seated in a horseshoe in individual desk chairs. Two of the students were seated to the right of SIL3, the rest were on her left. Most of the interactions happened with the group on her left, although she occasionally made an effort to include the two students to her right. Two of the students took turns to act as scribe to the group. While they were at the board, they did not interact much with the rest of the group. There was little reference to what they were writing on the board, which was an almost verbatim record of the verbal proceedings.

3.3.1 Student contributions

This session was dominated by SIL3. 69.79% of the interactions were made by SIL3. The following participants contributed the rest of the interactions: S1 (9.79%), S3 (6.38%), S4 and S5 (4.68% each), S2 (2.98%). S6 and S7 each contributed less than 2% to the session. The frequency of the forms of the element IF is presented in Table 9 and Figure 11.

Table 9 - Frequency of the forms of element IF – Session 3

Participant	Clarify	Comment	Disagree	Elaborate	Explain	Inform	Question	Invite	Justify	Probe	Query	Record	Request	Req. Ass.	Suggest	Support	Total Participation	Participation Rate
S1	0	0	0	2	2	12	2	0	0	0	0	0	1	0	3	1	23	9.79
S2	0	0	0	0	1	4	1	0	0	0	0	0	0	1	0	0	7	2.98
S3	0	0	0	1	1	12	0	0	0	0	0	0	0	0	1	0	15	6.38
S4	0	0	0	0	1	9	0	0	0	0	0	0	0	0	1	0	11	4.68
S5	0	0	0	0	1	8	2	0	0	0	0	0	0	0	0	0	11	4.68
S6	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	1.28
S7	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0.43
SIL	1	1	0	7	17	26	62	4	0	10	0	2	9	0	8	17	164	69.79
Total	1	1	0	10	23	75	67	4	0	10	0	2	10	1	13	18	235	100.00

Figure 11 - Frequency of the forms of the element IF - Session 3

111
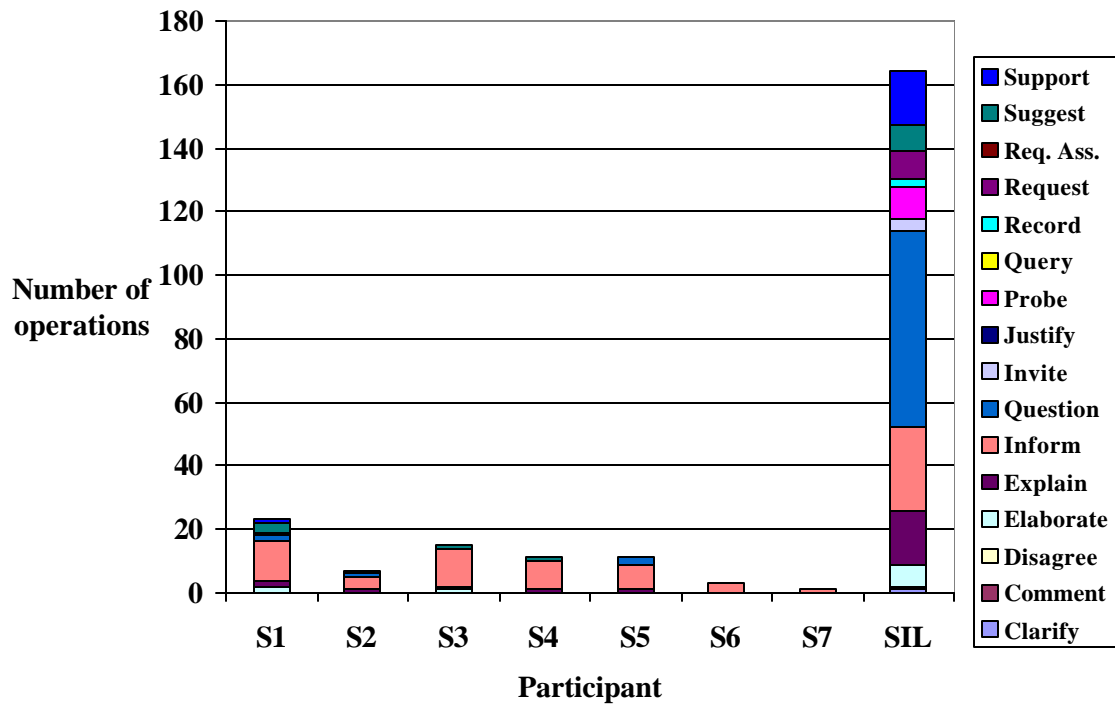
The most frequent forms of IF contributed by the students were: inform (69.01%), followed by explain (8.45%), and question and suggest (7.04%) each. Other forms of IF occurred less than 5% each. The frequency of the forms of the element C is presented in Table 10 and Figure 12.

Table 10 - Frequency of the forms of element C – Session 3

Participant	Class Memory	Concept	Example	Fact	Interpretation	Opinion	Problem	Puzzle	Reflection	Repetition	Strategy	Understand	Total	Participation Rate
S1	0	0	0	11	6	1	0	1	1	0	0	0	20	9.90
S2	1	0	0	3	1	0	0	0	1	0	0	0	6	2.97
S3	0	0	0	12	2	0	0	0	0	1	0	0	15	7.43
S4	0	0	0	7	1	0	0	0	0	0	3	0	11	5.45
S5	0	0	0	8	1	0	0	0	0	1	0	0	10	4.95
S6	0	0	0	3	0	0	0	0	0	0	0	0	3	1.49
S7	0	0	0	1	0	0	0	0	0	0	0	0	1	0.5
SIL	0	0	2	33	2	2	9	46	1	13	22	6	136	67.32
Total	**1**	**0**	**2**	**78**	**13**	**3**	**9**	**47**	**3**	**15**	**25**	**6**	**202**	**100.00**

**Figure 12 - Frequency of the forms of the element C
- Session 3**
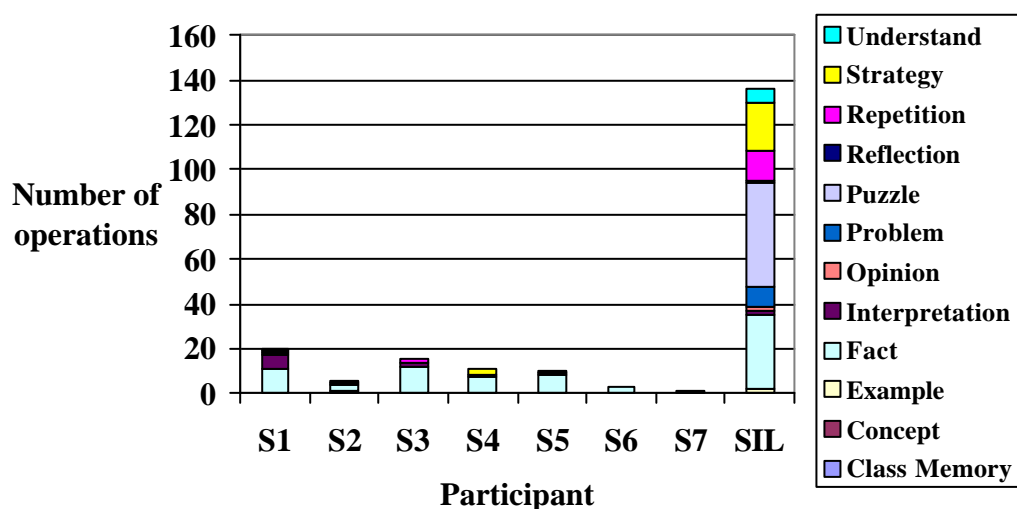
The most frequent forms of content contributed by the students were: fact (68.18%) and interpretation (16.67%). All other forms of content occurred less than 5%. The frequency of the forms of the element UF is presented in Table 11 and Figure 13.

Table 11 - Frequency of the forms of element UF - Session 3

Participant	Amplify	Concept Clarification	Contribution	DCU	Direction	Engagement	Group	Inter-subjectivity	Individual Needs	Participation	Task	Total	Participation Rate
S1	0	0	17	1	0	0	0	0	2	0	3	23	9.79
S2	0	1	5	1	0	0	0	0	0	0	0	7	2.98
S3	0	0	13	2	0	0	0	0	0	0	0	15	6.38
S4	0	0	7	0	0	0	0	0	1	0	3	11	4.68
S5	0	0	9	0	0	0	0	0	0	0	2	11	4.68
S6	0	0	3	0	0	0	0	0	0	0	0	3	1.28
S7	0	0	1	0	0	0	0	0	0	0	0	1	0.43
SIL	2	1	25	12	2	12	8	0	3	51	48	164	69.79
Total	2	2	80	16	2	12	8	0	6	51	56	235	100.00

Figure 13 - Frequency of the forms of the element UF
Session 3
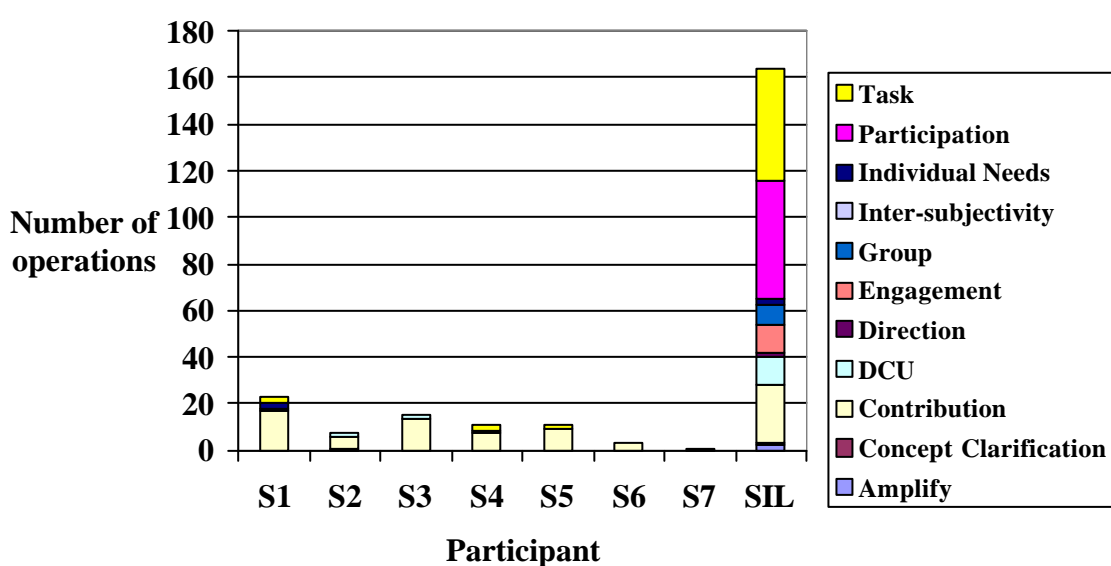
The most frequent forms of UF contributed by the students were: contribution (77.46%) and task (11.27%) and *DCU* (5.63%). All other forms of UF occurred less than 5% each.

The students did not use a wide range of different forms of the three elements. The following forms of the elements IF, C and UF contributed by the students exceeded those of SIL3:

IF: inform

C: fact, interpretation

UF: contribution.

3.3.2 Contributions by SIL3

The most frequent forms of IF contributed by SIL3 were: question (37.80%), inform (15.85 %), explain (10.37%), probe (6.1 %) and request (5.49%). All other forms of IF occurred less than 5% each.

The most frequent forms of content contributed by SIL3 were: puzzle (33.82%), fact (24.26%), strategy (16.18%), repetition (9.56%) and problem (6.62%). All other forms of content occurred less than 5% each.

The most frequent forms of UF contributed by SIL3 were: participation (31.1%), task (29.27%), contribution (15.24%), *DCU* and engagement (7.32%) each. All other forms of UF occurred less than 5% each.

4. A comparison between the contributions in the three sessions

Differences between the three sessions relate to the levels of participation of the SILs and students, and the nature of the inputs provided by the SILs and the students. The participation rates of the SILs in the three sessions seemed to have a significant impact on the interaction patterns and the quality of the interactions of the students. SIL1 contributed at a rate of 49.28%, SIL2 60.35%, while SIL3's contribution rate was 69.79% of the total contributions of SILs and students in the three sessions. It follows that the participation rate of the students was inversely proportional to the rate of the SILs: Session 1 (50.72%), Session 2 (39.65%) and Session 3 (30.21%).

The styles of the SILs were distinctive. This can be discerned through examining the types of forms of the three elements they used. SIL1 and SIL2 used a range of the forms of the three elements, while SIL3's use of the forms of the elements was limited. (See Table 16 for a breakdown of the extent to which different forms of the elements IF, C and UF were used by the three SILs.) The different forms of the elements can be sub-divided into the functions they serve in relation to the following aspects of the mediation of peer collaborative learning-teaching process: process management, cognitive engagement and first level cognition.

Process management has to do with all the factors that relate to developing a teaching-learning environment conducive to peer collaborative learning. Forms of the IF that relate to managing the peer collaborative process are: questioning, inviting participation, requesting help, supporting contributions by different participants, assessing whether intersubjectivity exists between members of the groups (i.e. whether everyone understands and follows the

process) and so on. Process management also includes providing support for individuals in the group in order to ensure psychological security so that participants are free to engage in the process without fear of embarrassment.

Cognitive engagement has to do with interactions and operations that demand that the participants engage with the teaching-learning process in a way that allows for the restructuring of knowledge. It is linked to interactions that demand or demonstrate a metacognitive involvement or understanding of the learning material.

Knowledge restructuring refers to using knowledge in a different form from the way in which it was originally presented. Rumelhart & Norman (1981) regard knowledge restructuring as "the creation of new structures either to reinterpret old information or to create new information" (cited in Marzano, 1991, p. 518). Vosniadou & Brewer (1987) see knowledge restructuring as "changing the theory base or explanatory system that guides the organization of information" (cited in Marzano, 1991, P. 519). Thus, for example, the integration of content with existing knowledge or constructing different examples of a phenomenon or thinking of how a body of knowledge could be applied in a different context contribute to the restructuring process. Elaborating on concepts and conceptualising different examples would be evidence of some level of knowledge restructuring.

Metacognition relates to the ability of an individual to monitor her thinking processes and how they are influenced as she works on a particular goal or task. Clarifying a concept, commenting, explaining, interpreting or justifying something, reflecting on knowledge or

thinking and devising strategies for working with material would form part of the metacognitive process at work.

First level cognition refers to tasks such as reading, computing, memorising, perceiving and learning language. It thus includes working with what an individual already knows. Sharing and recording factual information are forms of first level cognition.

Table 12 below provides an outline of how different forms of the elements IF, C and UF relate to mediating the peer collaborative process. It could be argued that the forms question and participation of the element IF, sometimes function to invite or develop cognitive engagement and not only a process management function. However, in most cases, in the SI sessions under investigation, they occur in relation to process management. Thus I chose to categorise them under process management. However, one needs to be mindful of the other purpose they do serve in some operations.

Table 12: Functions of elements and their forms in relation to the SI activity

	Process Management	**Cognitive Engagement**	**First level cognition**
IF	Invite Request Request Assist. Record Suggest Support Query Question	Clarify Comment Explain Elaborate Example Justify Probe	Inform
C	Concept Puzzle Repetition Understand	Interpretation Opinion Problem Reflection Strategy	Fact
UF	Amplify Direction Intersubjectivity Group Individual needs Participation Task	DCU Engagement	Contribution Concept clarification

Tables 13,14 and 15 provide comparisons of the contributions made by the students and SILs in each of the three SI sessions. The tables compare the rates at which each of the forms of the elements relating to the three aspects of the mediation process, namely process management, cognitive engagement and first level cognition were used by the students and the SILs, respectively, in each of the three sessions. The percentages were calculated by dividing the number of contributions by students and SIL, respectively, of each form of the elements, by the total number of contributions by each, to a particular aspect of the mediation process.

Table 16 compares the contributions by each of the SILs to the mediation process in terms of their usage of the different forms of the elements pertaining to their function in the mediation

process (i.e. process management, cognitive engagement or first level cognition). Table 17

compares the contributions by the students with regard to the same.

Table 13: Comparison of contributions by SIL1 and students in Session 1.

	Process Management								Cognitive Engagement							First Level Cognition		
Interactive Function	Invite %	Query %	Question %	Record %	Request %	Request Assistance %	Suggest %	Support %	Clarify %	Comment %	Disagree %	Elaborate %	Explain %	Justify %	Probe %	Inform %		
SIL1	9.49	---	24.82	---	2.92	---	4.38	10.95	11.68	8.76	---	2.19	2.19	2.19	6.57	13.89		
Students	---	2.84	12.06	---	0.71	1.42	7.09	4.96	2.84	8.51	4.26	6.38	3.55	2.84	---	42.55		

Content	Puzzle %	Repetition %	Understand %						Concept %	Example %	Interpretation %	Opinion %	Problem %	Reflection %		Class Memory %	Fact %	Strategy %
SIL1	14.29	14.29	13.33						1.90	7.62	5.71	3.81	2.86	8.57		---	18.10	9.52
Students	4.8	4	2.4						1.6	8.8	10.4	6.4	2.4	5.6		5.6	44.8	3.2

Underlying Function	Amplify %	Direction %	Group %	Individual Needs %	Intersubjectivity %	Participation %	Task %		DCU %	Engagement %						Concept Clarification %	Contribution %	
SIL1	2.19	2.19	6.57	---	7.30	10.95	31.39		25.55	8.76						---	5.11	
Students	---	2.13	1.42	0.71	4.26	2.13	---	17.73	15.60	---						---	56.03	

Table 14: Comparison of contributions by SIL2 and students in Session 2.

	Process Management								Cognitive Engagement							First Level Cognition
Interactive Function	Invite %	Query %	Question %	Record %	Request %	Request Assistance %	Suggest %	Support %	Clarify %	Comment %	Disagree %	Elaborate %	Explain %	Justify %	Probe %	Inform %
SIL2	4.38	0.73	24.82	5.84	2.92	0.73	7.30	4.38	3.65	10.95	0.73	8.03	10.95	0.73	6.57	7.30
Students	---	1.11	8.89	---	---	3.33	7.78	6.67	---	---	1.11	3.33	6.67	1.11	---	60

Content	Puzzle %	Repetition %	Understand %	Concept %	Example %	Interpretation %	Opinion %	Problem %	Reflection %	Class Memory %	Fact %	Strategy %
SIL2	11.11	17.59	8.33	---	7.41	35.19	0.93	3.70	5.56	---	3.70	6.49
Students	1.16	3.49	1.16	1.16	9.3	15.12	8.14	5.81	1.16	1.16	52.33	---

Underlying Function	Amplify %	Direction %	Group %	Individual Needs %	Intersubjectivity %	Participation %	Task %		DCU %	Engagement %	Concept Clarification %	Contribution %
SIL2	7.30	3.65	4.48	---	3.65	8.03	17.52		35.04	8.03	6.57	5.84
Students	1.11	3.33	---	---	1.11	1.11	---	6.67	25.56	---	5.56	55.56

Table 15: Comparison of contributions by SIL3 and students in Session 3

	Process Management								Cognitive Engagement							First Level Cognition		
Interactive Function	Invite %	Query %	Question %	Record %	Request %	Request Assistance %	Suggest %	Support %	Clarify %	Comment %	Disagree %	Elaborate %	Explain %	Justify %	Probe %	Inform %		
SIL3	2.44	---	37.80	1.22	5.49	---	4.88	10.37	0.61	0.61	---	4.27	10.37	---	6.1	15.85		
Students	---	---	7.04	---	1.41	1.41	7.04	1.41	---	---	---	4.23	8.45	---	---	69.01		

Content	Puzzle %	Repetition %	Understand %						Concept %	Example %	Interpretation %	Opinion %	Problem %	Reflection %		Class Memory %	Fact %	Strategy %
SIL3	33.82	9.56	4.41						---	1.47	1.47	1.47	6.62	0.74		---	24.26	16.18
Students	1.52	3.03	---						---	---	16.67	1.52	---	3.03		1.52	68.18	4.55

Underlying Function	Amplify %	Direction %	Group %	Individual Needs %	Intersubjectivity %	Participation %	Task %		DCU %	Engagement %						Concept Clarification %	Contribution %	
SIL3	1.22	1.22	4.88	1.83	---	31.1	29.27		7.32	7.32						0.61	15.24	
Students	---	---	---	4.23	---	---	11.27		5.63	---						1.41	77.46	

Table 16: Comparison of contributions by the SILs in the three SI sessions

Process Management								Cognitive Engagement							First Level Cognition
Interactive Function	Invite %	Query %	Question %	Record %	Request %	Request Assistance %	Suggest %	Support %	Clarify %	Comment %	Disagree %	Elaborate %	Explain %	Justify %	Probe %	Inform %
SIL1	9.49	---	24.82	---	2.92	---	4.88	10.95	11.68	8.76	---	2.19	2.19	2.19	6.57	13.89
SIL2	4.38	0.73	24.82	5.84	2.92	0.73	7.30	4.38	3.65	10.95	0.73	8.03	10.95	0.73	6.57	7.30
SIL3	2.44	---	37.80	1.22	5.49	---	4.89	10.37	0.61	0.61	---	4.27	10.37	---	6.1	15.85

Content	Puzzle %	Repetition %	Understand %	Concept %	Example %	Interpretation %	Opinion %	Problem %	Reflection %	Class Memory %	Fact %	Strategy %
SIL1	14.29	14.29	13.33	1.90	7.62	5.71	3.81	2.86	8.57	---	24.26	9.52
SIL2	11.11	17.59	8.33	---	7.41	35.19	0.93	3.70	5.56	---	3.70	6.49
SIL3	33.82	9.56	4.41	---	1.47	1.47	1.47	6.62	0.74	---	26.47	16.18

Underlying Function	Amplify %	Direction %	Group %	Individual Needs %	Intersubjec-tivity %	Participation %	Task %	DCU %	Engagement %	Concept Clarification %	Contribution %
SIL1	2.19	2.19	6.57	---	7.30	10.95	31.39	25.55	8.76	---	5.11
SIL2	7.30	3.65	4.48	---	3.65	8.03	17.52	35.04	8.03	6.57	5.84
SIL3	1.22	1.22	4.88	1.83	---	31.1	29.27	7.32	7.32	0.61	15.24

Table 17: Comparison of contributions by the students in the three SI sessions

	Process Management								Cognitive Engagement							First Level Cognition
Interactive Function	Invite %	Query %	Question %	Record %	Request %	Request Assistance %	Suggest %	Support %	Clarify %	Comment %	Disagree %	Elaborate %	Explain %	Justify %	Probe %	Inform %
Student 1	---	2.84	12.06	---	0.71	1.42	7.09	4.96	2.84	8.51	4.26	6.38	3.55	2.84	---	42.55
Student 2	---	1.11	8.89	---	---	3.33	7.78	6.67	---	---	1.11	3.33	6.67	1.11	---	60
Student 3	---	---	7.04	---	1.41	1.41	7.04	1.41	---	---	---	4.23	8.45	---	---	69.01

Content	Puzzle %	Repetition %	Understand %	Concept %	Example %	Interpretation %	Opinion %	Problem %	Reflection %	Class Memory %	Fact %	Strategy %
Student 1	4.8	4	2.4	1.6	8.8	10.4	6.4	2.4	5.6	5.6	44.8	3.2
Student 2	1.16	3.49	1.16	1.16	9.3	15.12	8.14	5.81	1.16	1.16	52.33	---
Student3	1.52	3.03	---	---	---	16.67	1.52	---	3.03	1.52	68.18	4.55

Underlying Function	Amplify %	Direction %	Group %	Individual Needs %	Intersubjectivity %	Light Relief %	Participation %	Task %	DCU %	Engagement %	Concept Clarification %	Contribution %
Student 1	---	2.13	1.42	0.71	4.26	2.13	---	17.73	15.60	---	---	56.03
Student 2	1.11	3.33	---	---	1.11	1.11	---	6.67	25.56	---	5.56	55.56
Student 3	---	---	---	4.23	---	---	11.27		5.63	---	1.41	77.46

Table 18 compares the rate at which SILs and students, respectively, contributed to the three

aspects of the mediation process. This was done by calculating the total number of

contributions (i.e. all the forms of the elements) by SIL and students, respectively,

to each aspect of the process.

Table 18 - Comparison of rate of attention given to different aspects of mediation by the SILs and students in the three sessions in terms of total contributions by each.

	Process management	Cognitive engagement	First level cognition
SIL1	52.51	32.98	14.51
Students 1	23.34	26.04	50.61
SIL2	44.76	45.29	9.95
Students 2	15.79	25.94	58.27
SIL3	60.56	16.38	23.06
Students 3	12.98	12.98	73.04

An analysis of Table 18 reveals that there was a great difference between the scores of the

first two SI leaders and those of SIL3. SIL3 spent nearly two thirds of the session on process

management. She also spent considerably less time on cognitive engagement issues compared

to the other two. Her effort on first level cognition issues accounted for nearly 25% of her

total contributions.

The proportion of time spent on cognitive engagement by SIL1 and SIL2, needs to be seen in

the light of the fact that SIL1's session seemed to have been a more successful session, and

that SIL2 was more active than her students whereas the students did slightly more than SIL1

in Session 1. It also needs to be seen against the background of the nature of the student inputs

in the two sessions.

The students in Session 2 contributed more of their total interactions in the session on cognitive engagement issues than the students in Session 1. However, it is clear from Table 18 that the students in Session 1 assumed a greater level of responsibility for the teaching-learning process than the students in the other two sessions.

In terms of process management, the one form of IF that stands out with all three of the SILs is *question* with the proportion of puzzle-type questions being exceptionally high in the case of SIL3. In terms of cognitive engagement, the forms of the element relating to the *development of conceptual understanding (DCU)* stands out. The form of the element UF that stands out in relation to process management is that of *task*. There was a marked difference in the level of attention paid to process and cognitive engagement by SIL3. She awarded nearly 60% to the management of the process and only 16% to cognitive engagement. This large imbalance points to the difficulty she experienced in getting the students to participate in the teaching-learning process.

4.1 Mediation styles of the SILs

One could label the styles used by the SILs by looking at the forms of the elements that seem most prevalent in their interactions as well as the way they have structured the tasks in their respective sessions. In addition the level at which the students contributed may also be an indication of the SIL's facilitation style. SIL1's style can be described as *enabling*. His type of facilitation allowed the students in Session 1 the freedom to contribute extensively to the peer collaborative learning process. It enabled a high degree of engagement by the students. Students in Session 1 spent less time sharing information and facts than the students in the other two sessions (see Table 17), and more time asking questions, commenting and

126

elaborating on contributions. If one compares the contributions of the SIL and students, in terms of the total number of operations in the three session (SIL's plus students') it is clear that there was a greater sense of shared responsibility for the learning- teaching process than was the case in the other two sessions (see Table 19).

SIL2's style was one of providing (Van Vlaenderen, 1997). This can be seen from the high proportions of *comment, explain, elaborate, interpretation,* and *DCU* contributed by SIL2. SIL2's contributions are characterised by a very high level of interpretations. Thus she provided much of what she perceived students needed to understand. Students in Session 2 played a limited role in terms of process and in terms of cognitive engagement compared to the rate at which the SIL contributed to those aspects of the session (see Table 19).

SIL3's style can be categorised as *probing (*Van Vlaenderen, 1997) or *interrogating* given the high proportion of questions and the frequency with which students were urged to participate. She offered a high proportion of factual information – 24.26% of her contributions related to providing or clarifying factual information. Much time was spent sharing strategies for tackling the essay or learning lists of information. Students in Session 3 contributed minimally to process management compared to the SIL. The ratio of SIL and student contributions in Sessions 2 and 3 in terms of cognitive engagement was more or less the same ratio.

Table 19: Comparison of contributions made by SILs and students in the three SI sessions in relation to their combined contributions to the session and in relation to each other's contributions to the different aspects of mediation.

Base	Session	Process management %	Cognitive engagement %	First level cognition %
A	**SIL1**	25.32	15.90	7
	Students	12.09	13.49	26.21
B	**SIL1**	67.69	54.11	21.07
	Students	32.31	45.89	78.93
A	**SIL2**	26.39	26.7	5.86
	Students	6.48	10.65	23.92
B	**SIL2**	80.28	71.49	19.69
	Students	19.72	28.51	80.31
A	**SIL3**	41.96	11.31	15.92
	Students	4.02	4.02	22.77
B	**SIL3**	91.26	73.79	41.15
	Students	8.74	26.21	58.85

A: **Contributions to each aspect of mediation as a percentage of the total number of operations contributed by all participants in the session.**

B: **Comparison of contributions by SIL and students to process management, cognitive engagement and first level cognition, calculated in relation to the total number of contributions to each aspect by all the participants in the session.**

See Table 21 (Appendix E) for the total number of contributions by the different participants of each form of the elements relating to the different aspects of the mediation process.

5. Conclusion

In all three sessions the SIL played a dominant role. The most important function of all three SILs was to structure the session and tasks and to encourage participation and contributions by students. Another important role was related to helping students towards deeper engagement with the learning material.

Although all three of the SILs seemed to share these functions, they differed in the way in which they tried to achieve their goals. From the data it was evident that an enabling leadership style generated greater participation by students. In order to achieve a high quality of participation seems to require engagement with both task and process. The task needed to be set so that it enabled all students to make a meaningful contribution towards its execution. The task in a collaborative learning environment should be complex enough to necessitate collaboration. Finally, students needed to be able and willing to engage with the tasks.

In the next chapter the nature and content of interactions and operations will come under the spotlight. The quantified data presented in this chapter will thus be complemented by qualitative data in Chapter Six. Both sets of data will be used to draw conclusions about the process of peer collaboration in the SI sessions.

CHAPTER SIX

THE DATA – MEDIATION PATTERNS

1. Introduction

In this chapter I present data that illustrate the patterns of mediation that occur in the SI sessions under discussion. The data for this section emanate from a second reading guide applied to the data. This reading guide consists of three questions that all relate to the nature of mediation in the three SI sessions:

- What does the data reveal about the role of the *task* in a SI session?

- What does the data reveal about the role of the *SI leader* in a SI session?

- What does the data reveal about the role of the *students* in a SI session?

2. Mediation of learning in SI

Mediation in SI is influenced by many different factors. How the SIL sets up the physical layout of the room seemed to be significant to the interaction patterns that are allowed to emerge during the session. In the previous chapter I explained the differences in physical layout between the three sessions. It was clear that students not directly within the line of sight of the SI leader participated less than students with whom the SI leader could easily maintain eye contact throughout the session. Thus it can be said that the physical layout of the SI room influenced the patterns of interaction that could potentially develop in the sessions.

This chapter will focus, however, on the other factors that influenced the mediation of learning in SI. Learning in SI is mediated through language by the SI leader and by the peer group and through the use of tools, such as the textbook, student notes and the writing board. I shall start the presentation of the data by looking at what the data reveal about the nature of the task, then I shall discuss the role of the SI leader before finally discussing the role of the students in the mediation process. The data will be presented as extracts from the three SI sessions.

3. The role of the task in the mediation process

An important feature of the mediation process is the nature of the task and the way the presentation of the task is mediated by the SI leader or the student who initiates the task.

3.1 The nature of the tasks

The type of task had a great influence on the level of engagement students developed with it. Task type relates to the content of the task as well as to how the execution of the task is structured. The task in Session 1 was a complex one. The task spanned several sessions. In the previous session the group had covered part of it. By the end of this session, the task had still not been completed. The overall task was a problem question relating to *delict* and it included aspects of wrongfulness, fault, blame, pain and suffering, and remedies. The overall task could thus be broken down into several sub-sections. Within each of those subsections students needed to understand complex legal concepts, the different tests, for example, how to test for wrongful behaviour and they needed to be aware of the case law they could refer to in

support of their arguments. Thus the task offered many opportunities for deep engagement by the group. In Session 1 it was obvious that the task was to be discussed by the group as a whole. The responsibility for participating in the task was experienced as the responsibility of the whole group.

The summary task in Session 2 was also divided into several smaller tasks, mainly by SIL2. She introduced several smaller concept clarification tasks. SIL2 demonstrated how the summaries could be presented as concept maps. She interpreted the summaries and asked for as well as gave clarifying examples. Content clarification and developing conceptual understanding were thus important aims of this session. Various students were assigned the task of summarising sections of the work. The rest of the group seemingly perceived this as their exclusive task as none of the other students present in the session had prepared to discuss those sections.

In Session 3 there were two main tasks: the one was a discussion about the essay and the second one involved developing an understanding of the theories about the structure of intelligence. Here, too, concept clarification and understanding the course content seemed to be the main aims. In this session it seemed as if there was an expectation that the group would discuss the task. However, in this case, it seemed as if the way the session was structured and the manner in which SIL3 perceived her role, resulted in the session being dominated by SIL3.

A number of different types of tasks were done in the three SI sessions. In all three sessions the task was set during the previous week. Students were expected to prepare so that they

could discuss the task in the session. There was a difference, though, in the way the tasks were conceptualised in the three sessions. Where the task was perceived as the responsibility of the whole group, the teaching-learning process could successfully involve the majority of the students. However, where it seemed as if only some students accepted responsibility, it was difficult for the peer collaborative process to be successful.

3.2 Structuring of tasks and sub-tasks

The overall structuring of SI sessions seemed to rest with the SIL. However, when students felt that they had the authority, they introduced subtasks of their own. The SIL was generally responsible for indicating the end of a subtask and inviting contributions when students were not forthcoming. Activities were frequently punctuated with phrases such as "What's the next step?", "I want to go on to…", "Okay, do you want to go on a bit?" when the SIL felt that a task had been completed. They probed for depth of engagement through asking for examples and more extensive explanations. It was the SILs' responsibility to assess students' levels of understanding and to challenge individuals to examine their level of understanding or commitment to ideas.

The SIL's task included making sure that the students kept track of where they were in the process of completing the task. The following is an example that illustrated how SIL1 summarised every now and then and clarified what they were trying to achieve: "Okay, does everybody understand what we're doing, where we're going? We're trying to formulate not the perfect answer, but a good, well-structured answer to this question. Okay."

3.3 The negotiation of tasks and student participation

The extent to which the leader took the time to establish intersubjectivity with the students, whether the leader was open to negotiating the task and how students' participation was invited and/or negotiated with the group played a role in developing a sense of task and process ownership within the groups. The extent to which the leader was able to make students feel comfortable about making themselves vulnerable in front of others and the ways in which she facilitated participation by students were crucial to the nature of the learning that could take place in SI. The manner in which the task was initiated and the nature of the task influenced the potential for learning in the session.

3.3.1 Transitions between tasks in Session 1

An analysis of the raw data and the graphical representation of the session reveals that the session consisted of six subtasks. These subtasks were done in fourteen stages. Stage 15 was the closure of the session. See Appendix C for the graphical representation of Session 1.

Stage one: SIL1 brought the session to order and initiated the work by creating intersubjectivity. He ensured that everyone was clear about the progress reached on the task during the previous session. At the start of the session he invited students to participate in a task he chose with the aim of creating intersubjectivity. He ensures that everyone is clear about the progress reached on the task during the previous session.

Stage two: SIL1 negotiated the content of sub-task 1. He also negotiated individual

participation with the group. This transition happened through a question by SIL1 about the direction of the session.

Stage three: During this stage, S3 initiated sub-task 1 through a question about the content of the next stage. This followed an open invitation by SIL1 for the presentation of the next phase of the task.

Stage four: S1 initiated a disagreement about the classification of the problem under discussion. The disagreement was resolved through input by S4, S3, S2 and SIL1.

Stage five: SIL1 re-established intersubjectivity by reminding the group about the direction of the main task after the resolution of the disagreement. He did this after asking whether everyone understood where they were heading.

Stage six: S5 initiated sub-task 2 through a question about the appropriate strategy to deal with the content area in the examination.

Stage seven: S2 initiated sub-task 3 through disagreeing with the categorisation of the problem. This was followed by a request to expand on a point made earlier by S3.

Stage eight: SIL1 negotiated Sub-task 4 by asking for suggestions about the next phase of the task. The task is established. SIL 1 inquires whether the concept under discussion is understood. Understanding of concept clarified.

Stage nine: S2 initiated sub-task 5 through a question about the epistemic nature of the task. Her problem is resolved.

Stage ten: Re-establishment of intersubjectivity after sub-task 5.

Stage eleven: S5 initiated a return to sub-task 4 by developing a different example to test her understanding of the concept discussed earlier as part of sub-task 4.

Stage twelve: SIL1 initiated sub-task 6. They discuss different types of loss and the conditions under which remedies can be applied for.

Stage thirteen: SIL 1 concluded the first part of sub-task 6 by establishing whether the group understood the discussion fully.

 Stage fourteen: SIL1 introduced the second part of sub-task 6 by eliciting suggestions about the next step in solving the problem. More types of loss are discussed. Several examples of the different concepts are given in order to clarify the concepts.

 Stage fifteen: SIL1 drew the session to a close.

In most instances the nature of the task and who initially participated in the task was negotiated. Transitions between tasks happened primarily through questions, invitations and disagreements. Various participants in the SI session introduced the tasks and sub-tasks. The establishment of intersubjectivity formed an integral part of transitions between sessions.

3.3.2 Transitions between tasks in Session 2

An analysis of the transcript and the graphical representation of this session reveal that the session was made up of the following stages:

Stage one: The task was established through a conversation between SIL2 and S1 who had been assigned the task of presenting her summary. The conversation helped to develop intersubjectivity in relation to what S1 planned to do.

Stage two: SIL2 invited an explanation of a concept from the group and explained why it was important for students to understand the concept.

Stage three: S1 continued with her contribution. There were occasional interruptions by the SIL with the aim of developing or establishing conceptual understanding.

Stage four: SIL2 inquired whether the group understood. This initiated a long discussion about a concept with the aim to develop understanding of the concept.

Stage five: SIL2 tried to negotiate broader participation from the group. S1 continued her discussion. Conversation to develop understanding of a specific concept occurred during this stage.

Stage six: This stage was introduced when SIL2 asked whether the concept was understood. During this stage there was a focus on the development of conceptual understanding around specific concepts mentioned by S1.

Stage seven: S1 continued. There was a discussion about the meanings of concepts. She informed the group of the direction of the next part of their contribution.

Stage eight: S1 continued. This stage consisted of the development of conceptual understanding with regard to the next concept under discussion.

Stage nine: SIL2 initiated Task 2. The presentation by S5 was interspersed with interpretations and explanations by SIL2.

Stage ten: S5 asked an epistemic question that SIL2 and fellow students tried to clarify for him.

The nature of tasks was not negotiated in this session. There was some limited negotiation of participation. However, most students were either unwilling or unprepared to participate. There were only two tasks in this session. The discussions were about developing understanding of concepts mentioned by the two presenters, S1 and S5. No metacognitive issues emerged from the students during this session. An epistemic question was asked towards the end of the session and seemed to be the direct result of the explanations and interpretations by SIL2.

3.3.3 Transitions between tasks in Session 3

An analysis of the transcript and the graphical representation of this session reveal that the session can be divided into the following distinct stages:

Stage one: SIL3 introduced the task that was decided upon during the previous week's session. She negotiated participation.

Stage two: SIL3 explained how she would approach the essay under discussion. She intermittently tried to involve the students through asking them to contribute what they knew.

Stage three: SIL3 introduced a discussion on research studies on heredity by asking students what they knew about its role in human intelligence.

Stage four: Focus on the studies about the influence of environment on intelligence.

Stage five: SIL3 informed the group about the change in the direction of the discussion. This was the last phase of the discussion of the essay.

Stage six: SIL3 informed the group that she wanted to move on to Task 2. She invited them to participate in the discussion.

Stage seven: SIL3 forced participation by all students by getting them to take turns reading about a particular theory from the textbook.

Stage eight: SIL3 asked whether they knew about strategies that could be used to learn lists. During this stage S4 explained how to use mnemonics.

Stage nine: SIL3 introduced an explanation of Thurstone's and Guildford's theories of mental abilities.

Stage ten: SIL3 announced the end of the task and the session. This was followed by a discussion about the imminent test.

SIL3 took control of the interactions from stage two onwards. All the stages were initiated by SIL3.

The tasks in this session were not negotiated at any point. The students initiated none of the tasks or subtasks. At no stage did SIL3 involve the students in discussions about the nature of tasks or sub-tasks. The only time a topic was initiated by a student was during the final stage of the session when S1 needed to know about the logistics of an imminent test.

SIL3 tried to negotiate participation by students at several intervals during the session. Students were generally willing to participate, but SIL3 did not give them enough time to respond. She also showed them what she would do and say without giving them an opportunity to think about their own responses to the essay question. This may have had the effect of intimidating students and thus limiting participation.

3.3.4 Introducing the task

In this section I shall show how the three SILs started their SI sessions. The mediation patterns that emerged during the first few minutes of a SI session set the scene for patterns during the rest of the session.

Below are extracts from the start of each of the three sessions. I shall present the excerpt from

each session followed by a brief discussion. The numbers on the left of each extract indicate the number of the operation; XXX refers to a part of the contribution that was inaudible; … indicates that the contribution was not completed, or that the voice of the participant trailed off and / indicates that the speaker was interrupted and unable to complete his/her contribution.

Extract 1: Session 1

1	SIL1	Let's review the facts we drew together last week.
1.1		Okay, who wants to start? (*He sees that S1 looks as if he would like to say something*)
1.2		S1, do you want to start?
2	S1	We defined delict, and then we went to the elements of delict … interpretation.
3	SIL1	Does everybody understand the path that we followed?
3.1		Is everybody happy with it? Is everybody happy with how far we are?
3.2		We just got as far as elements.
3.3		Where are we going to now?
4	S2	We have already expanded on the elements. We expanded up to wrongfulness.
5	SIL1	Ja, we expanded on the elements.
5.1		Who wants the next one?

In the above excerpt the SIL1 set the scene. He reminded them of what was done the previous time. He offered an open invitation for participation to the group. SIL1 was sensitive to the group's body language. He noticed that S1 was ready to participate and he (S1) was invited to start. SIL1 wanted to make sure that the group members were all at the same point, that

intersubjectivity had been established.

He invited them to participate in setting up the starting point for the next part of the task (3.3). S2 further established the path they had followed during the previous session. They expanded on the elements of *delict* and had to take the task further during this session. SIL1 invited them to start on the next phase of the overall task (5.1). SIL1 did not state what it could be. Rather, he offered the group freedom of choice. Thus, within the first one and a half minutes of the session he established with the group that their participation was expected and they responded positively to that invitation. SIL1 also established that the decision-making power in the group was shared. Thus the first minutes were integral in the establishment of criteria and expectations for the SI process.

The second excerpt is taken from Session 2. This session was based on a task set during the previous week. After greeting the group, SIL2 reminded them about the task they had decided on the previous week. S1 had prepared the summary on Thought Processes and she was invited to start. She started by stating the six points she intended to focus on in her summary.

Extract 2: Session 2

2.1   SIL2   So, you're giving yourself basically a mental picture of it. Okay.
                (*SIL2 draws a concept map on the board as S1 talks*)

2.2   Are you going to start with concepts or…?

3   S1   Ja.

4   SIL2   (*SIL2 cleans the board and writes the word "concepts" on the
                board. She starts with a concept map of the subsection concepts.*)

5	S1	Concepts influence our cognitive progress, through processes and ultimately our behaviour. (*She reads from her notes.*)
6	SIL2	Okay, hold on. (*She needs time to write*)
6.1		Influences – cognitive processes, etc (*she writes*)
6.2		Can somebody maybe give us a definition of what would encompass cognitive processes?
6.3		Just generally, from what you've done so far.
6.4		Cognitive processes. What do you think?
7	S2	Thought.
8	SIL2	Thought. How else can we …
8.1	SIL2	Okay, you probably get cognitive …

SIL2 set herself up in front of the class at the board. She acted as scribe to S1. S1 had been given the power to hold the floor initially by virtue of the fact that she had prepared the summary that made up the first part of the session. The first minute and a half was made up of exchanges between SIL2 and S1. SIL2 invited students to offer a definition of the concept "cognitive processes". A definition asks for a specific response. S2 provided a limited response. SIL2 acknowledged the contribution and then asked how else the concept could be defined (8). She did not give the group much opportunity to respond and think about it before she offered her suggestion. At this point she effectively shared the power with S1. This may have inhibited possible participation by other students in the group.

SIL2 established that participation by the rest of the group would be sought. At this point the task was not negotiated with members of the group. S1 had made decisions about how she wanted to approach the task. By drawing the concept map on the board as the summary was being presented, SIL2 modeled a different way of presenting the summary.

The following extract contains the first few minutes of Session 3.

Extract 3: Session 3

1	SIL3	XXX brief overview of what intelligence is.
1.1		Okay, let's hear from anyone what a brief overview of intelligence is as an introduction to your essay.
2	S1	IQ could be included.
3	SIL3	IQ could be a way of measuring intelligence.
3.1		What is intelligence?
4	S1	Ability
5	SIL3	Okay, there's no specific definition.
5.1		Like, how would you describe it?
6	S1	Ability to think rationally.
7	SIL3	(*to student writing on the board*) Just put that above XXX.
7.1		Okay, let's just look at what the book says for those who have books.
7.2		What would you include in the introduction?
7.3		What have they said about intelligence? Okay, have you read about intelligence at all? From what you have heard in the lectures what did she say about intelligence?
8	S2	She spoke about how to measure intelligence.
9	SIL3	What about measuring intelligence?
10	S2	XXX
11	SIL3	Sorry, I can't hear you.
12	S2	XXX approaches XXX.

The overall task was to discuss the structure and content of an essay on intelligence. The SIL did not establish the task clearly with the group. They struggled to create intersubjectivity. She found it difficult to establish rapport with the students. They were willing to offer their suggestions, though. This group was slow to warm up, but she did not give them enough or appropriate opportunities to do so. Instead of following the trail of their thinking, she immediately appealed to the authority of the book (7.1). The tone set at the start of a SI session tends to pervade it. Establishing the task is largely a question of establishing intersubjectivity in relation to the task and the process through which the task will be handled.

4. The role of the SI leader

The ability of the SIL to mediate successfully depended on factors such as the mediation style of the leader and the level and quality of participation by the students. In Chapter Five I characterised the mediation styles of the three leaders as *enabling* (SIL1), *providing* (SIL2) and *interrogating* (SIL3). Mediation style may be influenced by, amongst other things, the responsiveness of the students and the leader's ability to manipulate the teaching-learning milieu and her level of confidence about the content area under discussion.

4.1 The importance of establishing intersubjectivity

In Chapter Two I discussed Wertsch's notion of intersubjectivity with regard to the mediation process. A critical task of a SI leader is to ensure that a high level of intersubjectivity exists with regard to the nature of the task, and that intersubjectivity is developed as tasks aim to develop students' understanding.

Below are some examples of how SILs went about ensuring intersubjectivity at different stages of the task.

Extract 4: Session 1

76.5	SIL1	Does everybody understand causation – what we mean by XXX?
77	S6	Direct link between lethal accident as opposed to/
78	S1	As opposed to refusal to take a blood transfusion after the accident.
79	SIL1	Does everybody understand that link in causation?
80	S5	Do you know what happened? As you flew out the window as a result of the accident, lying in the road, another driver drives past and drives over you. Would that give you causation?
81	SIL1	Well, what do *you* think, using that…?
82	S5	Ja, because I wouldn't be in the road in the first place if it wasn't for the accident.
83	SIL1	Okay. Do you see what you've got to look at? Who caused the accident? How was the accident caused that threw you out the window? Do you understand?
83.1		You're not going to look at the person driving over you.
84	S5	I am looking at it like the guy who actually caused my accident, so…
85	SIL1	How was the accident caused? Normal driver. Car in front of him slams on the breaks, could not stop in time. You flew out the window.
85.1		What do you think in that case? Does the test, what does the test say – but for the…
86	S2	But for X's conduct, the result would not have occurred.
87	SIL1	X is the driver in that case. What do you think? X is driving normally, etc.
88	S2	You're saying X was the driver, he caused the accident.

89	SIL1	The passenger flew out the window.
90	S2	There is a direct link because if X had not/
90.1		How as X driving?

This extract illustrates the ongoing process during the teaching-learning process of establishing intersubjectivity by ensuring that the participants share the same situation definition and by letting them know that they do. In the extract SIL1 and the students take responsibility for developing intersubjectivity. The process of learning includes a perpetual shift in or redefinition of situation or concepts in favour of "a qualitatively new one" (Wertsch, 1984, p. 11). SIL1 did not provide an answer. Rather, he modeled a way in which the student could help herself develop an answer to her own question. Fellow students participated in the process of creating understanding.

The following example was taken from Session 2. This extract illustrates the shifts in situation definition that occurs during the learning process.

Extract 5: Session 2

S1	112	Scripts. XXX activity influences people's attitudes and behaviour. We all are used to interpreting new information and events.
SIL2	113	But how does this happen?
	113.1	Does anybody know how this happens?
S2	114	It's when we require new/
SIL2	115	So we create scripts from that knowledge?
S2	116	Maybe when we learn a new pair of actions.

SIL2	117	Usually involves people's behaviour.

S2	118	People's attitudes and behaviour.

SIL2	119	So, maybe all these things impact on one's attitudes and one's behaviour.

When the SIL did not offer clear indications of what the task was, students floundered. The following example from Session 1 illustrates the importance of creating intersubjectivity so that the interaction can be productive.

Extract 6: Session 1

19.2	SIL1	I've drilled into everybody a set formula for answering these questions.

19.3		That is: a definition of the section you're doing. In this case it's *delict*. Just write them out, quickly state them.

19.4		What's the next step?

20	S2	Expanding with examples.

21	SIL1	With examples being?

22	S3	XXX The story. The thing that sticks in your mind.

23	SIL1	The thing that sticks in your mind, like?

24	S5	The one we did yesterday.

24.1		Like the students … what was that student?

25	S4	(*Whispers to S3)* Can I get yesterday's notes from you?

26	S2	Like the woman who …

27	SIL1	That Stevenson case. …

28	S2	You're talking about delict and you're giving a Criminal Law …

The question was decontextualised and students found it difficult to respond satisfactorily. Creating the context is an important part of defining the situation. In this section very little sense was made and little achieved. Some students were willing to oblige SIL1 for a while. The temporary lack of focus was rescued by S2 who then asked to take the proceedings in another direction.

4.2 Sharing strategies

One of the roles of the SIL is to share ideas about strategies for learning with students. The SILs' experience in terms of learning strategies was used by them to help students reflect on problem-solving strategies (Session 1) or to give them ideas about what they could use in answering questions (Sessions 2 and 3). SIL1 demonstrated a strategy that can help students solve difficult problems in law in the example below.

Extract 7: Session 1

142	S2	Then how come you have the XXX remedy for pain and suffering related to bodily injury?
143	SIL1	Ja, it's the same kind of thing. You can put it under both.
144	S2	Okay.
145	SIL1	I don't want you to be confused about it.
145.1		It can go under both remedies.
146	S1	What would you recommend? (*students laugh*)
147	S2	I think you should ask Prof. X that.

148	S4	I just want to read you what it says here under definition of patrimonial loss. It says: "It is calculated by determining the value of the plaintiff's estate …if *delict* had not been committed." And it also says (*she reads from a different set of notes*): "To calculate an amount in cases of personal injuries which loss usually takes the form … makes up for loss of earnings."
149	SIL1	That fell under?
150	S4	That was both for patrimonial loss.
151	S1	Hmmm.
152	SIL1	If you have a definition and an example it can sort things out like that (*clicks his fingers*). I promise you. You don't even have to ask Prof. X. (*laughter*).

Here the SIL created a playful opposition between the students and the professor. If students learn strategies to solve their own problems, they can get along without the professor.

In the next extract SIL3 taught students about the use of mnemonics to remember lists.

Extract 8: Session 3

119.1	SIL3	From past experiences you've had with other courses in Psychology where you've had to remember many things. How do you remember them…?
120	S4	Well, you could try mnemonics.
121	SIL3	Okay, how do you do that?
122	S4	Well, take the first letter of each of the seven.
123	SIL3	Okay, and then?
124	S4	XXX
125	SIL3	Okay, did you hear that? You take the first letters of, or whatever method you have and you just try and form a word. Just remember that there are seven, okay. And then try and form a word and from that word, remember the seven as they are …

SIL2 reminded them often that their own ideas could form a valuable part of an essay.

> So, maybe, if you're discussing it, then you could actually point out the similarity that you see. Only because it's mental models, it does not necessarily mean you can't associate it with images. Even though you're discussing it separately, but when you're seeing links, okay. When you're looking at them together and seeing links, it shows that you're thinking about it. It shows that you're critically thinking.

4.3 The SIL as near-peer

There were several ways in which the SILs established their position as a near-peer. The use of language in the mediation process seems to be important. SIL1 used inclusive language – he referred to "we" and "us" more often than to "you". For example, he used phrases like the following: "Let's review the facts we drew together last week", "What was the last thing Prof. X told us about...?" and "Where are we going now?". SIL2 said things like, "Can you help us with that?". SIL2's use of language approximated that of the students closely, as is evident from the following short excerpt:

Extract 9: Session 2

| 69 | SIL2 | Oh, like a proposal, kind of thing? Okay. |
| 70 | S2 | So, it's like your own opinion, kind of thing? |

4.4 Sharing the process

SIL1 offered students the choice of the direction in which the session was moving. He

frequently asked: "Where are we going now?", "What's the next step?" and "Does anyone want to offer a suggestion for what we do next?". Not interrupting a speaker and inviting gestures also signalled to them that they could participate freely. In addition SIL1 subtly let the students know that together they could solve problems without the help of the professor. After working through an intricate section, he said: "If you have a definition and an example, it can sort things out like that (*clicks his fingers*). I promise you, you don't even have to ask Prof. X. (*Laughter from students*).

4.5 Acknowledging ignorance

One way in which the SILs established their status as fellow students was to acknowledge when they did not know. Sometimes this was used as a device to get students involved in the discussion, and at other times the SILs really did not know. Either way, it stimulated participation from the group.

Extract 10: Session 2

65.2	S1	They identify relationships between a concept, e.g. the cat and the property of the concept, e.g. the fur. (*She reads from her notes*).
66	SIL2	Proposition.
66.1		Does everybody get that? Do you understand that?
66.2		I don't.
66.3		Did you find you understood it when you read it?
66.4		XXX Can you put it in another way? Can you explain it in another way?

67	S5	I think it's more knowledge that you know about. A certain image of something that, that…
68	SIL2	Oh, like a proposal, kind of thing? Okay.
69	S2	So, it's like your own opinion, kind of thing?
70	SIL2	Is it like your own opinion?
71	S2	Because to, its what you know. So if you look at a spider, you think all spiders are poisonous. If you actually, like me think all spiders are poisonous. Even though I have no cause to know all are poisonous. It's just how I feel about something.
72	SIL	So, then. There is obviously a difference between a proposition and a fact … Because all snakes are not poisonous.
73	S2	Ja, it says here: "A proposition …"

Here S2 helped SIL2 to understand the concept of *propositions* after SIL2 claimed ignorance (66.2). The elaborated exchange between SIL2 and S2 helped to clarify the concept. S2 used the book to back up her example. S1 only deviated from her prepared notes once during the session. This occurred after the above exchange.

Extract 11: Session 2

76	S1	Did you understand the part where it says they identify the relationship between a concept and the properties of a concept?
77	SIL2	Not really, what relationship?
78	S1	If I mention a cat, the first thing you'll think about is, "A cat has fur".
79	SIL2	Ja, association. So the relationship that they're referring to is the association between the cat and what you think as being the property of the cat or a dog or whatever it is you've been talking about.
80	S1	And if you see something that looks like a cat and does not have fur, you know it's not a cat.

81	SIL2	Ja.
82	S1	And then the other type is mental models.

This was the first time S1 moved the action forward without the SIL asking her to do so. It seemed as if the fact that SIL2 admitted ignorance helped her to gain a sense of her own authority to "teach". This was the first time S1 did not refer to her notes in order to respond. Thus it was her first attempt at a real conversation in this session. In operation 77 SIL2 used the appropriate word for the concept described by S1 in her example. She thus, in a subtle way, helped to develop the students' vocabulary.

4.6 Reflection on the learning process

The SILs often reflected on the learning process taking place in the SI session allowing the students to think about the tasks on a metacognitive level. Below are some examples:

> It's like a map, an image as well. Your own representation of what you're thinking about. So, maybe if you're discussing it, then you could actually point out the similarity that you see. Only because it's mental models, it does not necessarily mean you can't associate it with images. Even though you're discussing it separately, but when you're seeing links, okay. When you're looking at them together and seeing links, it shows that you're thinking about it. It shows that you're critically thinking." (SIL2)

> X is to blame. That is the link you need to find. That is the causation link. All causation means is: Is there someone to blame? Is somebody at the root of the cause of it? Now if you say, "Yes, that person did cause it", or "He could have caused it", then you're to say to yourself: Has he acted in a way that it could be said that it was his fault? He did something. His action was wrong, or this action was bad, so he caused it. (SIL1)

4.7 Creating zones of restricted development

Where students were not given the opportunity to explore, learning was stunted. Craig (1988) refers to this missed opportunity as the *zone of restricted development.* This zone indicates the space where, with proper mediation, the student(s) could have developed their understanding. This happened when, either students were not willing to participate, or the SIL was not able to see and exploit a learning opportunity. Often the SIL was not willing or capable of handing over any authority to the students. Premature cognitive commitment was another way in which the zone of development was restricted. Below are some examples.

Extract 12: Session 2

127.8	SIL2	So that is how you use scripts to interpret new information. That is why you need to discard some of it so that you can interpret new information and events or accommodate new information and events.
128	S2	So would you say that schizophrenia also falls under the scripts that a person needs to discard? Is it internalised or learnt?
129	SIL2	It depends. No we XXX think that schizophrenia is a collection of things, okay? XXX.
129.1		Do you want to tell us the next, hello!

Here S2 presented the class with something that could have been potentially fruitful. However, the SIL did not engage with her in the discussion, nor did she give other students the opportunity to offer their thoughts on the matter. She gave a tentative idea and then moved the activity along.

When the SIL's content knowledge was inadequate it limited the extent to which she could

assist students to develop their conceptual understanding. Below is another example from Session 2 where SIL2 seemed unable to help students:

Extract 13: Session 2

6.2	SIL2	Can somebody maybe give us a definition of what would encompass cognitive processes…?
6.3		Just generally, from what you've done so far.
6.4		Cognitive processes. What do you think?
7	S2	Thought
8	SIL2	Thought. Okay. What is cognition or what's cognitive?
8.1		How else can we …
8.2		You probably get cognitive; you probably get behaviour…
8.3		It's like a psychological concept.
8.4		If they ask you a question on it they're not gonna ask in any other way but that it's a cognitive process or it's cognitive.
8.5		So you need to understand exactly what it is or not when they ask you to approach this particular question when it comes up in cognition XXX. So that's something you should know that you don't know. You have to find out about it.
8.6		What is cognition? What is cognitive?
8.7	SIL2	It's a concept you have to think and brainstorm about. You have to go and find out about it.

Imprecise sentence constructions (or mediation through imprecise language usage) may have been a consequence of poor conceptualisation. SIL2 was not sure of what she was trying to say. The SIL's situation definition was poor. Thus her sentences were garbled and she was unable to assist students to develop their understanding of the notion of cognitive processes.

She provided vague, incomplete phrases that did not provide clarification or a path for thinking about the concept.

A final example from Session 2 illustrates how development can be restricted through the inability of the SIL to see how she can help students to develop their understanding. In this example S1 tried to reach intersubjectivity with SIL2 but she failed to establish it. SIL2 either misunderstood her, or her own understanding was limited and she chose to move on.

Extract 14: Session 2

109	SIL2	If that was the case, then we'll just go to lectures, the lecturers will tell us whatever. We'll absorb it and make our own mental representations of it and they will be exactly the same, and they're *not* exactly the same. …
110	S1	You, what you mean is if you tell me something and I understand it in my own way, not the way you were telling me?
111	SIL2	You could be understanding it in your own way, or it could be really the way that I'm telling you. But it could actually be not the way that I'm telling you. So there's an element that it could be accurate. You could be lucky. I could really explain it very well and you would actually really understand. Or it could be that maybe I'm not explaining well or maybe you're not understanding me well. But at the end of the day you've got a completely different representation of what I was telling you.
111.1		Where were we? Oh, that was all about mental images.

Below is an example from Session 3 that illustrates how SIL3 restricted the learning potential of the interactions.

Extract 15: Session 3

7.2	SIL3	What would you include in the introduction?

7.3		What have they said about intelligence? Okay, have you read about intelligence at all? From what you have heard in the lectures what did she say about intelligence?
8	S2	She spoke about how to measure intelligence.
9	SIL3	What about measuring intelligence?
10	S2	(*Very soft*) XXX
11	SIL3	Sorry, I can't hear you.
12	S2	XXX approaches XXX.
13	SIL	In a general discussion about intelligence, what is intelligence? Without using approaches (*She looks at S2*)
14	S1	Add to think rationally. (*to student writing on the board*)
15	SIL3	How I would answer it, okay, I'd say, …

SIL3 and the group were struggling to develop intersubjectivity. She was not very patient and did not offer them opportunities to elaborate. SIL3 asked multiple questions without pausing to give the students opportunities to consider them. After some attempts by students to get into her frame of mind, she proceeded to tell them how she would write the introduction to the essay. She effectively took authority over what was acceptable. It seems that the problem in this session emanated from the SIL3's impatience with the group and the fact that intersubjectivity was not established from the beginning. From the initial interactions it seemed as if students were willing to participate, albeit at a limited level. However, they were not encouraged by the SIL. By jumping in to give quite a lengthy exposition of how she would do it, she effectively silenced the students for much of the rest of the session. This session was in sharp contrast to Session 1 where there were frequent and elaborated student contributions.

Below is an example of a typical exchange in Session 3. This follows directly after SIL3's suggestions in the previous extract about what would go into her introduction. None of the initial student responses were longer than one sentence.

Extract 16: Session 3

17.4	SIL3	That would be like my introduction. I won't XXX.
17.5		I'll go back to the topic. I'll talk about the two determinants – heredity and environment.
17.6		And I'm sure that you all know from other courses you've done. We have done heredity and environment. You should have a lot to say about that.
17.7		What would you say about heredity?
18	S3	XXX genetic XXX.
19	SIL3	Okay, just put that. (*to scribe at the board*)
20	S4	It's inherited.
21	SIL3	It's inherited, okay.
21.1		And then in answering the question. What is the question asking for? What is the question asking for? Like the end part of the question. What do they want?
21.2		Using research findings which are?
21.3		It's all in your book. You can even remember from the past, from other courses you've done.
22	S5	Research that was done by looking at the intelligence of rats.
23	SIL3	Okay, what's that? That's the animal studies. What about animal studies can you tell me?
23.1		That's what they're asking for in the question. Different studies that have been done. You have to explain each one.

| 23.2 | | Like each one that's been done. What conclusion has been made from the studies? So what XXX animal studies |

This excerpt is typical of the interactions between SIL3 and her students. There were very few instances of students elaborating on earlier contributions from others, and almost all of them elaborated about known content. There were no instances of speculation or interpretation by students. The possible value in this session lay in students hearing information about studies about intelligence a second time after the lecture. Very little, if any, processing of the material took place here. It had everything to do with the way the session was mediated. SIL3 did, however, take pains on several occasions to make it clear to the students what the question was asking for. Thus she focused on activating the students' metacognitive awareness regarding the exercise.

4.7.1 Surface learning

SIL3 struggled to get students to participate freely. She attempted to get students to say something by suggesting the use of the textbook. However, again this was merely reporting content rather than restructuring information:

Extract 17: Session 3

95	SIL3	He (*Thurstone*) said total intellectual ability is dependent on seven mental abilities. Okay. Which are? … (*To S*) Which are? Just name them. XXX.
95.1		Okay, let's just go round. The one's who've got books, just mention one and explain what it is.
96	S1	Verbal comprehension. The ability a person has to comprehend ideas in word form. (*Reads*)

97	SIL3	Okay, next one.
98	S7	Verbal fluency. The ability to express yourself fluently in words.
99	SIL3	Okay, can you remember any? (*He does not have a book.*)
100	S4	No.
101	SIL3	Okay. They say there's numerical ability which you reckon is the?
102	S4	XXX do like problems and things like that.
103	SIL3	And mathematics, okay.
104	S4	With figures.
105	SIL3	With figures, ja. Okay?
106	S5	Numerical ability.
107	SIL3	That's just what he said.
108	S5	Memory.

4.4.2 The influence of content related contributions influence participation

Long, content related contributions from the SIL had the tendency to silence students. If, however, the SIL mainly used extended contributions to offer strategic advice, this did not seem to have a negative influence on student contributions. SIL1's elaborated contributions were mainly of the second type. Below is an example.

> What is important to remember is, the reason they give you these tests is…
> When you're answering a question if you're not sure of where to go, you
> can always rely on one of these tests that you know to answer. You tell
> yourself: What would the reasonable man have done? The same thing with
> this. It is important to know that in case you do get stuck. But, obviously, if
> they get too much for you, it's up to you whether you want to learn them.

In this extract SIL1 offered the students a way of distancing themselves from the problem to

enable them to look at it productively rather than to be overwhelmed by it.

SIL2's extended contributions were typically to interpret what student contributors said. This type of contribution had a mixed effect: students did not get much opportunity to participate, but it did give them a chance to see how a student could engage with the material in order to make sense of it.

> Do you remember earlier, we were talking about studying techniques? Somebody talked about, I think it was for brain and behaviour. Because those concepts were just so difficult and either you want to swot it and you don't know how to swot it. … So that's your mental image of whatever it is you create. It's like you put it there in whatever way so that the process you're thinking about can be understandable to you. So, meaning it's quite subjective and it can vary, depending on what's easier for you to understand.

The above two examples also illustrate how the SILs engaged students at a metacognitive level through their reflections on the tasks.

Compare this with a typical extended contribution by SIL3:

> Stimulation and attention. Okay, what about stimulation and attention? That's related to, based on what you said about attention. It's closely related but just explain.
> Okay, let's say you have children, like the study they did here. When you have children and they took some children and put them under the care of some people who did not give them enough attention and stimulation…

SIL3 asked a question but did not give the group an opportunity to engage with it. She proceeded to offer her answer and thus passed up an opportunity for active engagement by the group.

The SIL's use of language could be inviting or intimidating. In Session 3 the SIL frequently used language in a way that interrogated students and had a negative influence on the

161

atmosphere in the session and thus on students' will to participate. The following examples from Session 3 illustrate this point (45.9 and 49).

Extract 18: Session 3

45.8	SIL3	So what about environment do they say enhances intelligence? Can someone give me an example?
45.9		For those who have books, I don't know why you're pondering or why you're quiet because it's looking at you. I would rather excuse those without books than those with books. I ask and you don't know XXX I mean, it's just there.
46	S3	Nutrition and intelligence
47	SIL3	What? What about nutrition?
48	S3	They argue that intelligence can affect a child even before birth if the mother has had bad nutrition and that can affect the unborn child.
49	SIL3	What else that doesn't include nutrition; that does not include the mother?

The next example also comes from Session 3. It illustrates how the SIL's response may have inhibited participation by students. SIL3 did not respond positively to the inputs by the students (45.9). She made students feel bad about their limited participation. Also, the suggestion that it might be wrong to ponder, was counter-productive as a major part of learning does indeed involve pondering. In operation 49 she dismissed S3's contribution.

Extract 19: Session 3

9	SIL3	What about measuring intelligence?
10	S2	XXX
11	SIL3	Sorry, I can't hear you.
12	S2	XXX approaches XXX.
13	SIL3	In a general discussion about intelligence. What is intelligence? Without using the approaches.

5. Style of questioning

The type and number of questions asked by the SIL seem to be significant in determining the nature of the interactions that will take place in the session. SIL1 asked 34 questions. Most of these were questions concerning the process of the session. For example, the following questions: "Is everybody happy?", "Where do we go next?", "Can you help us with that?", "Do you understand?" and asking for examples made up the majority of the questions asked by SIL1. He asked several puzzle-type questions demanding "banked knowledge" from students.

SIL2 asked 34 questions. The majority of the questions were of the following variety: "Do you understand?" "Can we go on?" She also asked several questions with the aim of clarifying her understanding of what students were saying. Four questions were puzzle-type questions.

In contrast SIL3 asked 62 questions of which 46 were puzzle-type questions. The SIL asked

so many questions because she wanted to involve the students, but the questions had the opposite effect. On many occasions she asked several questions in rapid succession without giving the students opportunity to respond (Extract 16: 21). Very few questions challenged students to think deeply about the work; instead, they quizzed how much they knew about the topic. This is in the nature of multiple-choice tests and the task structure needed to be carefully considered so that it could accommodate involvement by all the students.

6. Mediation by peers

Peers are able to mediate the teaching-learning process when they are able and willing to do so. The students participated in the teaching-learning process in a variety of ways that were influenced also by the SILs mediation style. Table 20 summarises the various ways in which students participated in the SI sessions.

Table 20: Student tasks in SI

First-level cognition contributions	Clarification of categories Help with clarifying terms, pronunciation Offer alternative examples Provide factual information
Promotion of learning goals	Questions of epistemic nature Reflect on metacognition Elaborate on what SILs and others have said Challenge others' claims, including SILs' Explore own understanding Offer alternative examples Clarify concepts Take initiative to introduce new tasks Answer SIL's questions Answer fellow students' questions
Use of resources	Clarify points by finding proof in textbook, notes Record notes on board

Peer collaboration occurred when students were given power to participate by the SIL. This authority was given to students in subtle ways, for example through where the SILs positioned themselves in relation to the students. The close proximity of students and SIL in Session 1 was probably one of the factors contributing to the high level of peer collaboration in the session. I shall now show extracts of the types of peer collaboration that occurred in sessions.

Extract 20: Session 1

5.1	SIL1	Who wants the next one?
6	S3	It's faults isn't it?
7	S4	Fault, blamefulness, accountability.
8	S3	With accountability you have to distinguish between accountability and the different forms of fault.
9	SIL1	Will you help us with that?
10	S3	Okay, for the accountability you must find out what is the age of the children. At what age they can be held responsible. XXX *capex, napex*. And the different types of fault. *Dolus* is, isn't it *eventualis dolus, indirect dolus, …*
11	S1	That's for criminal law.
12	S4	That's not part of delict.
13	S1	XXX In Austin they put it under criminal law. He put it under criminal law.
14	S2	Ja.
15	SIL1	It's for both. It is like a universal concept that follows through all parts of law. So ja. For those of you read Austin? Well done!

This extract illustrates several aspects of peer collaboration that can take place should all the

right conditions prevail. SIL1 drove the structure of the session but he gave the students choices. In most cases they chose when they wanted to participate. S4 expanded on S3's contribution (7). They created a conversation. SIL1 interrupted to ask S3 for more information on the types of fault. S1 challenged the categorisation of the types of fault under *delict*. Thus there was opportunity for cognitive conflict to develop. S1 offered proof of his contestation (11). When S2 agreed, SIL1 resolved the controversy by providing an answer. Note that SIL1 also commended good scholarly behaviour (15). Thus in this excerpt several important learning moments occurred: students elaborated on each other's contributions; they voiced their disagreements and created cognitive conflict; the conflict was cleared up by collaborative input by SIL1, S1 and S2; and content knowledge was developed.

Students sometimes initiated collaborative tasks. In the extract below, the impetus for the task initiation came from a belief that the proceedings were beyond the scope of the field of law under discussion (28).

Extract 21: Session 1

28	S2	You're talking about *delict* and you're giving a Criminal Law…
29	SIL1	(…)
30	S2	Can I expand on … sorry, I forget your name?
31	S3	S3
32	S2	S3. You know, when she was talking about fault.
32.1		Within fault they mention negligence and I found you have to mention the test for negligence because it's going to apply in your final answer.

33	SIL1	Okay, what is the test for negligence?
34	S4	Foreseeable aspects and, okay.
35	SIL1	And the case?
36	S4	Kruger vs. Kruger
37	S2	Houghton vs. Stone
38	SIL1	Okay, we offer two. Kruger vs. Kruger. (*laughter from group*) Coetzee vs. Coetzee is easy.

S2 decided to elaborate on a point S3 made earlier (30). She initiated a different direction for the discussion. SIL1 saw an opportunity to assess their knowledge of case law (33). The issue brought up by S2 was an epistemic one. SIL1 acknowledged the new direction of the task and he started to direct the new task by asking questions about content he deemed important.

Students enter into collaborative engagement in order to develop their own and each others' understanding. An example is presented in the excerpt below.

Extract 22: Session 1

61	SIL1	S5, do you understand causation?
62	S5	Ja, I mean, ja.
63	SIL1	Could you offer an example?
64	S5	Of causation? No.
65	SIL1	(*to the group*) Offer an example we can relate to causation.
66	S6	An example is drunken driving. He mentioned drunken driving that is a direct cause of an accident.

67	S1	I remember the lecturer saying you must, if you harm a person and he goes to hospital and he is supposed, he refuses to have a blood transfusion and he dies. Then it's not your fault. So, it must relate directly to your action, have direct cause. Not like if he goes to hospital and he refuses and dies.
68	S2	And there is also a test for it …We're mentioning all aspects, causation and everything. But would you have to go through the whole process?

In this case the students contributed to help S5 understand an example of causation. S1 and S2 elaborated by mentioning another important aspect relating to causation, namely the test for it. At the end of her elaboration, S2 asked an epistemic question for the consideration of the group.

Below is an example where students helped someone with a legal term.

Extract 23: Session 1

70	S2	There is a test.
71	SIL1	Did Prof. X give you a test?
72	S3	No, he said that the test for actual causation was that *sine qua …(trails off, she does not know the phrase)*
73	S2	*Sine qua non.*
74	SIL1	*Sine qua non.*
75	S3	But for the bad conduct, whatever, ja.

Here S2 and SIL1 helped S3 with the correct terminology.

Peer collaboration was initiated when a student recognised that there were issues she did not understand. The following excerpt is a case in point.

Extract 24: Session 2

92	S1	The example used here is an internal map. It's a map you make up in your own mind, maybe of how to get to the Psychology Department. They're not always accurate.
92.1		The last type is script.
93	S3	Why do they say they're not always accurate?
94	S5	XXX a way of getting to the Psychology Department.
96	S3	That's impossible.

This exchange was an attempt to help her see how mental maps can be inaccurate. She still did not see it at the end of the exchange. SIL2 then entered into a lengthy dialogue with her to try and help her see that mental maps can be either accurate or inaccurate. Students used the opportunity to ask questions about the epistemic nature of the work.

Extract 25: Session 2

149	S2	It's their theory.
150	S5	Whoever's theory this is, it seems like a perfect one. If it fails like, then you say I have to go back (to the initial stages of the problem-solving model). Then it's possible that if I go back and I fail again. What happens?
151	SIL2	Then you maybe need to think about …

When the learning environment was used to its full potential it created many opportunities for deep learning. For example, students got opportunities to work with many different examples of the same concept; they sought opportunities to test relationships of the content under discussion with other areas of the work; or they related what they did in SI with what was

done elsewhere in the course, for example in tutorials.

Extract 26: Session 1

76.5	SIL1	Does everybody understand causation – what we mean by XXX?
77	S6	Direct link between lethal accident as opposed to/
78	S1	As opposed to refusal to take a blood transfusion after the accident.
79	SIL	Does everybody understand that link in causation?
80	S5	Do you know what happened? As you flew out the window as a result of the accident, lying in the road, another driver drives past and drives over you. Would that give you causation?
81	SIL1	Well, what do *you* think, using that …
82	S5	Ja, because I wouldn't be in the road in the first place if it wasn't for the accident.
83	SIL1	Okay. Do you see what you've got to look at? What caused the accident? How was the accident caused that threw you out the window? Do you understand?
83.1		You're not going to look at the person driving over you.

Here the students worked together to construct alternative examples to try and explain how causation worked. The SIL challenged S5 to think through the problem herself rather than give the answer to her question without her having tried to work through it herself. This particular problem took a long stretch of interaction between several students and the SIL and multiple permutations of the problem to resolve the issue of causation.

Students had opportunities to draw relationships with work done in other parts of the course.

For example, in Session 1 S2 saw an opportunity to relate the work done in the session to an earlier example done in a tutorial (201 to end of extract).

Extract 27: Session 1

196	S7	Sorry, you say it has to be in front of you?
197	SIL1	No, not in front of you, other people.
198	S4	There, it's got to be witnessed.
199	S2	No. (gesticulates)
200	SIL1	Its got to change somebody's viewpoint of you and it must be/
201	S2	For instance, the tut we just did. That was not defamation. Why? Because it has to be said in front of other people. It wasn't publicised and this one is publicised.
202	S5	It wasn't defamation.
203	S2	But the woman wasn't charged with defamation.
204	S5	Ja, but only because he was her spiritual adviser.
204.1		No, but another thing they said …
205	S2	It would have been defamation if the woman had gone and publicised to the neighbours and the thingies and the thingies. But she didn't. It would have been defamation. She told this one guy.
206	SS	Ja
207	S7	She told this one guy. She told this priest whom she had confided in and she also had a history of regular confession with the priest.
208	S2	Yes. And what I'm telling you is the Law says it wasn't defamation because of that.

Below is an example from Session 2.

Extract 28: Session 2

122	S2	You know, in Psychopathology we also did something on scripts. They say scripts are like we play a role/
123	SIL2	Drama.
124	S2	Drama, kind of thing. Or almost the same thing. Or is it almost the same?
125	SIL2	What did they say about scripts?

6.1 Student-initiated discussions about metacognitive issues

There were several instances in Session 1 where students engaged in conversations that highlighted metacognitive issues. Below are some examples:

Extract 29: Session 1

15.3	SIL1	…we're trying to formulate, not the perfect answer, but a good, well-structured answer to this question. Okay.
16	S5	If we answer this in the exam, do we have to put down all these elements and expand on them?
17	SIL1	Very important.
18	S3	You can get the answer wrong and still get six out of ten.

Extract 30: Session 1

| 32.1 | S2 | Within fault they mention negligence and I found you have to mention the test for negligence because it's going to apply in your final answer. |
| 33 | SIL1 | Okay, what is the test for negligence? |

6.2 Semiotic mediation - opportunities for using the language of the discipline

The talk in SI helped students to practise a new use of language. They learned to use words and phrases with very specific meanings.

Extract 31: Session 1

158	S5	Basically, if you were to lose your arm. Well, you know, Prof. X gave us the example of where you still have pain and feeling in your arm six months after.
159	S2	Phantom pain.
160	S5	Yes …

Extract 32: Session 3

24	S5	They sort of were trying to find out how intelligent rats are. How different they can be. How rats can be intelligent in different ways. They took so-called dull rats and the intelligent, the bright rats. And they were trying to sort of find their abilities to walk out (*He searches for the right word.)*
25	SIL	The maze
26	S5	To walk out the maze. The maze problem. They found that the bright rats find it easier to walk out the maze problem.

The conversations in the informal setting of SI allowed students to practise the use of the new

language they needed to appropriate in the different courses. The peer collaborative process is tolerant of the imprecision that often accompanies the initial stages of discourse appropriation:

Extract 33: Session 1

S2	203	But the woman wasn't charged with defamation.
S5	204	Ja, but only because he was her spiritual adviser.
	204.1	No, but another thing they said/
S2	205	It would have been defamation if the woman had gone and publicised to the neighbours and the thingies and the thingies. But she didn't. It would have been defamation. She told this one guy.

6.3 Questions asked by students

Students in Session 1 asked seventeen questions. Many were puzzle-type questions, some asked for clarification, a small number asked for permission to expand on a point someone else had made earlier, or were epistemic in nature.

In Session 2 eight questions were asked. Most were puzzle-type questions; one was of an epistemic nature, another related to whether the SIL understood a point and one inquired about the relationship between a concept discussed in this session with the same concept covered in another section of the course.

None of the students' questions in Session 3 related to wanting to understand more of the

work under discussion. They were mainly to ask for repetitions or had to do with the test that was imminent at the time.

It would seem that the nature of the interactions influence the degree to which students are prepared to engage with the material.

7. Use of resources

The resources the groups made use of besides each other and the SIL included their notes, files and the textbook. It seems as if these resources were most successfully used to clear up misconceptions. It did not seem as if the way the book was appealed to in Session 3 was an appropriate way to use this resource as it stripped students of their authority. Using the examples the lecturers offered in the lectures seemed to be a useful tool.

Two of the SILs used the board to record the proceedings. SIL2 used it to draw concept maps on the board; thus she demonstrated how the ideas could be captured in a different form to the fully written out summary. SIL3 asked the students to use the board purely to record notes. However, she did not refer to the process of note taking at all, except to tell the scribe what to add. At the end of the exercise the notes were not used as a means to summarise the process.

The SILs' experience of strategies with the work was used by them to help students reflect on problem solving strategies (Session 1) or to give them ideas about what they could use in answering questions (Sessions 2 and 3).

8. Conclusion

In this chapter I have presented data to illustrate the range of interaction patterns in the three SI sessions I analysed for this research. A discussion of what the extracts indicate about mediation in SI sessions will be presented in the next chapter.

CHAPTER SEVEN

DISCUSSION OF RESEARCH FINDINGS

1. Introduction

In this chapter I draw conclusions from the results of the data analysis of the sample SI sessions. These conclusions are gleaned form the data in relation to the learning theories, sociocultural theory and activity theory discussed in Chapter Two and theories on collaborative learning, discussed in Chapter Three. I shall discuss what the data analysis reveals about the role of collaborative learning in mediating learning for all students at university, whether prepared or underprepared. Not all the aspects of the theory will be related to the research findings; however, they form the frame around which the discussion is woven.

The results of the data seem to indicate that collaborative learning, when appropriately mediated, can bring about meaningful learning. The following factors played an important role in relation to successful collaborative learning in the analysed sessions:

- The task - this includes the choice of task, the manner in which it is mediated by peers and a more competent other who mediates the process and who ensures that the learning is meaningful; quality of task engagement by participants.

- The role of the SIL in the teaching-learning process – this includes how the teaching-learning process is managed.

- The role of students – this includes their commitment to the process, their level of participation and how they perceive their status within the learning-teaching environment.

I shall now discuss what the data reveals about each of these factors. I shall begin by considering the role of tasks in SI.

2. Role and quality of tasks

One of the aims of SI is to allow students opportunities to practise higher order thinking. Marzano (1991) states that "higher order thinking involves the restructuring of existing knowledge and knowledge restructuring is facilitated by tasks with specific characteristics" (p.518). Tasks that facilitate restructuring are meaningful, complex and long term in nature. (For more on knowledge restructuring, see Chapter Five, Section 3).

Tasks are meaningful if students have an interest in them, that is, if the tasks fit in with their learning goals. Secondly, if students have some control over the tasks it adds to the meaningfulness of the tasks. Thus, Marzano suggests, students should have opportunities to select or construct some of the tasks they engage in as well as having influence on the pace at which the tasks are done.

Higher order tasks are also described as complex. Complex tasks are non-routine tasks that cannot be performed automatically (p.519). Non-routine tasks are not done every day and non-automatic tasks require conscious engagement. Decision making, naturalistic inquiry, problem solving, scientific inquiry and composing are examples of complex tasks. For a breakdown of the specific cognitive processes involved in these tasks, see Appendix D. However, tasks may be framed as complex, but mediated in ways that limit the depth of engagement required for the execution of the task through collaborative processes. Tasks are

177

long term if they have application beyond the specific task to other areas of the curriculum and the students' learning.

From the data it is clear that the SILs and their groups concentrated on the following types of tasks in their sessions within the framework of student to student, student to SIL or SIL to student interactions. The tasks were a combination of puzzle -type and ill-structured tasks (Strohm-Kitchener, 1983).

- Problem solving – ill-structured and puzzle (Session 1). The task in Session 1 was a typical Legal Theory problem solving task that required deep engagement, but also necessitated the recall of factual content in order to develop solutions to the problem.

- Concept clarification – puzzle (Sessions 1, 2 and 3). The meanings of concepts were clarified in all three sessions, for example, words and phrases such as abstract and phantom pain.

- Development of conceptual understanding – ill-structured and puzzle (Sessions 1, 2 and 3). In Session 1, for example, students developed their understanding of the concept of "accountability"; in Session 2, concepts such as "propositions" and in Session 3 different aspects of the concept of "intelligence" were discussed.

- Application of information – ill-structured (Sessions 1, 2 and 3). In Session 1 information was applied to different case scenarios; in Session 2 information was applied to aspects of daily life or students' experience of learning; in Session 3 the task was an attempt to see how students could apply what they had learnt to write an essay on aspects of intelligence.

- Recognition and reproduction of information – puzzle (Sessions 1, 2 and 3). In all three sessions recall of banked information was required in the completion of the SI task.

- Study strategies (Sessions 2 and 3) – puzzle. An example was the use of mnemonics to learn lists in Session 3. In Session 2 the SIL provided ideas on how the students could use what they knew to show that they were thinking critically about the work.

- Summaries – puzzle (Session 2). The major task of the session was to produce summaries of important content.

- Discussion of essay task – ill-structured and puzzle (Session 3). The consideration of how an essay could be structured and what information needed to be included in the essay was the task for this session. Recall of key information made up the bulk of the exercise.

The main tasks in each of the three sessions had the potential to become appropriate tools for mediating student learning. The Legal Theory task in Session 1 was divided into many sub-tasks that required students to develop their understanding of aspects of the law and provided them with opportunities to apply their knowledge of the law; they could relate the task to other areas in their course. It allowed them to engage their metacognition in order to examine the nature of problem solving tasks in Legal Theory and to assess what qualified as a proper solution to the task. The task of summarising course content in Session 2 had the potential to develop students' metacognitive awareness of the reading and study process; the essay preparation task in the third session was a complex composing task; the final task in Session 3 was the least complex as it focused on the recall of knowledge.

Kounin (1970) cited in Brophy & Alleman (1991) notes that the quality of "seatwork" influences the level of students' engagement with tasks. Zais (1976) cited in Brophy & Alleman (1991) notes that it is not so much the learning *activities* that influence what students learn, rather it is the learning *experience* that is engendered by the kinds of responses the

activities demand from students that impact on their learning. Zais suggests that good activities "provide for the attainment of multiple goals, engage students in active forms of learning, … help students to develop values and critical thinking capabilities, are built around important content, and are well matched to the learners' abilities and interests" (cited in Brophy & Alleman, 1991, p. 11).

Brophy & Alleman's research indicates that curricula with the focus on teaching for understanding and application have the following features: Breadth of coverage is de-emphasised; there is ample opportunity for information processing and meaning construction through discussions and activities; the "discourse" and activities provide opportunities for students to conduct inquiry, solve problems, make decisions or engage in higher order tasks related to the content. They further suggest that activities allow students to

> practise, develop, or apply content; to synthesize and communicate what has been learned; … to think critically about the content … *sets of activities* should include opportunities for students to do something with the content – to use it in the context of problem solving, decision making or other higher order applications (p.14).

The tasks in Session 1 contained the features outlined by Brophy & Alleman. SIL1's statement about the length of the exercise indicated a de-emphasis on content coverage in favour of developing understanding and metacognitive awareness: "So it's okay if this question takes us three weeks to manipulate, to solve, to set out. But I need you guys to know every single aspect."

2.1 Task engagement

Students in Session 1 had the multiple goals of concept clarification, learning and understanding legal terminology and how to apply the legal concepts, developing an understanding of how the law works and how to develop good answers to a problem question, among others. Critical thinking abilities were engaged through the process of dialogue. Students questioned, challenged, and made sense of concepts and ideas by grappling with them. Their thinking was sometimes "reflective and self-corrective, governed by reasons and criteria and directed towards the making of connections about the world" (Splitter, 1991).

The content was important in relation to student learning and servicing the domain specific content needs of the curriculum. Above all, students were actively involved throughout the session. As they worked through the task of discovering all the elements to consider when answering the problem question (which was the main task of the session), various smaller tasks were embedded within this one, bigger task. These smaller tasks contributed to the understanding of the main task and maintained student attention, as many of these tasks were the result of personal needs expressed by individual students in the group.

The students in Session 1 seemed to invest a lot in their discussion activities. The students initiated some of the tasks (see Appendix C for a representation of when, by whom, and how the tasks were initiated). They were engaged in information processing and restructuring and sense-making activities. They were not only involved on a cognitive level, but also affectively; they demonstrated interest in, as well as personal engagement with the content: "And there is a test for it. But you see, *this is where I want to know* ...But would you have to

go through the whole process?" (S2 – Session 1) and "That's so stupid. A mom dies, a family of kids" (S5 - Session 1).

If a SIL is to offer students choices about the tasks, she needs to be confident about her ability to manage the process that may not be totally within her control. A good knowledge of the content area to be covered, knowledge of the skills required to master the content and an ability to engage in active learning strategies go a long way to help the SIL keep focused on the learning process. The data seems to indicate that students in Session 1 had the greatest opportunity for involvement in the teaching-learning process through managing the SI process and through cognitive engagement. Students in the other two sessions had less opportunity for active involvement (see Table 19 in Chapter Five).

Johnson & Johnson (1991) in their summary of the features of collaborative learning (See Table 1, in Chapter Three, Section 3) mention positive interdependence as a prerequisite for successful collaborative learning. They argue that collaborative tasks should be set in such a way that students are not only interdependent in terms of the execution of the task, but also in terms of the marks they obtain for the task. They are thus in favour of group results for group tasks. In SI the only type of interdependence that can be set up, is goal interdependence. In other words, a situation where all students feel responsible for the whole group achieving its goal is desirable. Thus tasks and activities around the tasks need to be facilitated in a way that enables all the students to accept responsibility for successfully completing the task.

For Legal Theory SI groups the interdependence in terms of marks is tacit. If, as busy students, they spend their valuable time together to try and learn something, they need a pay-

off for their investment in terms of better marks. This type of interdependence is not so clear for Psychology students. In Psychology most of the tests written throughout the year are multiple choice tests. Many students do not cope very well with the way multiple choice questions in Psychology are structured. The language in which they are constructed makes it difficult for second language students to cope with the complicated, often confusing sentence structures. Thus, even though they seem to understand the work in SI, there may not be a pay-off in terms of good test results for multiple choice tests. Thus SILs in Psychology have to work extra hard to establish goal interdependence in the way they structure tasks and activities in order to make the students' time in SI meaningful.

3. Zone of Proximal Development

Cognitive controversy or uncertainty is an indicator of students' zone of proximal development and if the conflict is appropriately managed, it leads to learning. During episodes of cognitive controversy the three aspects that operate within the ZPD as outlined by Wertsch come into play. These aspects are situation definition, creating intersubjectivity and semiotic mediation. (See Chapter Two for a discussion of these three aspects of the ZPD).

3.1 Cognitive controversy

In Session 1 there were numerous instances of cognitive controversy and elaborated explanation, both of which are considered important for learning in collaborative learning groups (Johnson & Johnson, 1991; Cohen, 1994). Through the process of solving the cognitive controversy, deep processing of information occurs as the emphasis is on

understanding the content within the context of a particular problem. Within this process of conflict resolution is embedded ample opportunity for content mastery. Whenever cognitive conflict occurred in sessions one and two, it was initiated by the students. (See for example extracts 18 and 24 in Chapter Six). There was no cognitive controversy in Session 3. This could be an indication of the limited degree of engagement with the process and the tasks during that session.

If the mediation process is unable to establish the optimal preconditions outlined by Wertsch, it leads to a zone of restricted development (Craig, 1989).

3.2 Zone of Restricted Development

A zone of restricted development occurred mainly when a SIL was unable to assess students' situation definition or was unable to develop the discussion or activity appropriate for the student to clarify her confusion. Alternatively, if students did not have the confidence to assert their situation definition and demand that attention be given to their problem, growth was stunted (Extracts 12,13 and 14). When the SIL did not encourage students to participate by being negative about their participation or lack of it, it also stunted development. An example of this was Extract 11.

Factors that inhibited the learning-teaching process in the analysed SI sessions were the following:

- A seating plan that kept students physically removed from each other and the SIL and therefore inhibited face-to-face interaction (Sessions 1, 2 and 3);

- Task structures that limited participation to a few students only (Sessions 2 and 3);

- Tasks that demanded limited cognitive engagement or opportunities for knowledge restructuring (Session 3);

- Prolonged contributions of content knowledge by the SIL (Sessions 2 and 3);

- Frequent negative comments about and a lack of support for students' contributions (Session 3);

- Appealing to sources of authority without first having established students' sense of their own authority (Session 3);

- Limited content knowledge of SIL (Session 2).

3.3 Elaborated responses

According to Cohen (1994) elaborated responses to questions contribute to learning in collaborative learning groups. Students frequently initiated elaborated explanations in sessions 1 and 2. The SILs probed students to think more deeply about what they were saying (Extracts 20, 22). Thus students had opportunities to teach each other, enter into subject discourse and develop their own and others' understanding.

In Sessions 2 and 3 most of the explanations were provided by the SILs, thus there was a high density of tutorial talk rather than talk between students, as was the case in Session 1. Extract 17 and the examples in Section 4.4.2, Chapter Six) illustrate this point. Bargh & Schul (1980) postulate that students who teach other students tend to benefit much from the activity. Thus, the ones who benefited the most in these two SI sessions were the SILs as they afforded themselves frequent opportunities to teach.

185

4. First level cognition, metacognition and epistemic cognition

Different levels of cognition were activated during the sessions. First level cognition, where students work with what they already know, was most prominent in sessions two and three. Perkins *et al* (1993) found that, while a knowledge base was being built or extended, epistemological questions could not be foregrounded as intellectual energy was spent on first level cognition issues. Knowledge acquisition is important in order for students to be able to pay attention to issues of metacognition and epistemic cognition. Thus all three levels of cognition are required for learning in peer collaborative groups.

Metacognitive and epistemic cognition were activated by peer collaborative activities. Thus students were engaged in all three of Kitchener's cognitive processing levels discussed in Chapter Two. For example, SIL1 reminded the students of the aim of the task: "Okay, does everybody understand what we're doing, where we're going. Trying to formulate, not the perfect answer, but a good, well-structured answer to this question" (Extract 29). Thus SIL1 made the aims of the exercise explicit and made the students aware of the importance of understanding the process of problem solving in Legal Theory. Two student responses to this were: "If we answer this in the exam, do we have to put down all these elements and expand on them?" and "You can get the answer wrong and still get six out of ten". Thus there was emphasis on more than first-level cognition. As the students struggled to understand the nature and limits of the tasks, they were building metacognitive awareness of Legal Theory tasks. The reflections of the SIL facilitated the development of metacognitive awareness. In Session 1 the SIL reflected on how students could help themselves out of difficult situations

by considering what the "reasonable man" would do in a particular situation (see first example in Section 4.4.2, Chapter Six).

At the end of Session 2 one of the students remarked: "Can I ask a question? Are these people saying this one or this is a perfect way of solving a problem? … Whoever's theory this is, it seems like a perfect one. If it fails like, then you say I have to go back. Then it's possible that if I go back I fail again. What happens?" (Extract 25). This was not only an epistemic issue. It was also a confrontation with Perry's (1970) dualism-relativism continuum discussed in Chapter Two. SIL2 helped the student to see that there were many potential models that one could follow. However, sometimes SILs did not have the expertise to help students cross certain cognitive hurdles.

In Session 2, SIL2 modeled how to interpret the information in the textbook, but she did not give students the opportunity to practise the skill. She accepted the responsibility for interpreting early on in the session, so that when S5 shared his summary of the work, he expected SIL2 to expand on what he had prepared when he asked, "Would you like to expansiate" (sic)? Of course, SIL2 obliged and retained the power in the session. The opportunity for explicit metacognitive engagement was not utilised.

5. Semiotic mediation and the acquisition of disciplinary discourse

When students participated actively, they had ample opportunity to practise academic language, and more specifically, subject or discipline specific language. The process of semiotic mediation provided them with opportunities to acquire disciplinary discourse. The

peer collaborative context affords students opportunities to learn to engage in disciplinary discourse through learning discipline specific concepts and participating in discipline specific tasks. In Session 1 students learned about which types of cases pertain to criminal law and which to *delict*; they learned about the kinds of evidence required to prove accountability (Extracts 2, 21,26 and 27). It provided them with opportunities to see what counted as evidence and what not (Extract 27). In Sessions 2 and 3 there were many opportunities to hear the SILs use disciplinary language, and few opportunities to practise using it (Extracts 12, 17 and 18). The peer group is more tolerant of imprecise language-usage that is a feature of the language learning process.

6. The role of SIL

The main role of the SIL is to facilitate learning by mediating the tasks so that students are involved in joint productive activity that stimulates learning.

One of the factors that distinguished the quality of learning in the three sessions had to do with the way the tasks were mediated. If one's notion of learning is based on the principles that learning is an active process and that individuals construct their own knowledge, then a SIL has to mediate for maximum active participation and engagement by students. Thus she has to help students to develop a commitment to the task at the beginning of the SI session. This is done through ensuring intersubjectivity and through giving students power to influence the task and the process through which the task is handled. SIL 1 was particularly successful at negotiating task and participation and establishing intersubjectivity.

6.1 Negotiating participation

Students participated actively to solve problems in SI if they had an investment in the task and a level of choice about their participation. Frequent negotiations regarding choice or focus of tasks and inviting students to participate in a manner that preserved their autonomy helped to facilitate the group's investment in the process. Extracts 1, 20 and 22 from Session 1 are example s of how SIL1 negotiated students' participation in the tasks.

The negotiation of tasks and participation were integral to the process of power sharing in Session 1. The students in Session 1 seemed much more willing to take responsibility for their own learning and for sharing power within the group than students in the other two groups. They participated freely, asked questions, and answered them and posed problems. In Session 2 about half the group participated. This group consisted of twelve students. It could be argued that the group was too big for all the students to be actively involved. However, I have been present in sessions of up to eighteen that worked very well. In Session 3 the students initially seemed willing to participate, but SIL 3 seized power and in the process silenced the group. It was difficult for her to motivate the group to participate after her initial dominance (Extracts 3, 8 and 15).

Participation by students can be structured by the SIL. She invites participation from students and decides when students should be probed in order to deepen their engagement with the task. Quiet students need to be encouraged to participate. The SIL has to be aware of the students' body language so that those who seem keen to participate can be invited, or uncertainties can be noticed by paying attention to facial expressions. This helps the SIL to

work within the students' zone of proximal development. Examples of successful attempts to probe students to engage with the task can be seen in Extracts 1 and 22 from Session 1.

6.2 Process management

The role of SIL includes the imposition of a structure on the activities and the interactions. Structuring the interaction starts with making decisions about the physical layout of the room where SI sessions take place. Where students sit, whether they are able to make eye contact with every other participant in the session, including the SIL, is important for the promotion of face-to-face interaction (Johnson & Johnson, 1991). Students' proximity to others in the room will influence whom they will interact with. Limited interaction with students who could not be seen by the SIL without changing his or her position inhibited interaction with those students in sessions 1 and 3.

Maintaining the collaborative learning process is an important function of the SIL. This requires making sure that the level of intersubjectivity among participants is optimal for *joint* productive activity. SILs frequently asked whether students understood, whether they were happy with the way the SI process was taking place. See Tables 4, 7, 10 and 16 in Chapter Five for an indication of the frequencies with which SILs tried to ascertain whether students understood what they were doing in the session.

The SIL plays a role in making decisions about the kinds of activities that will engage students in active learning. What needs to be borne in mind is that it is joint productive

activity that leads to development. Thus the activities need to be structured in a manner that will ensure that the majority of students are able to participate in doing the tasks.

A high level of trust between SIL and students contributes to high levels of interaction. Students need to see that the SIL is genuinely interested in their progress through the task. Here the SIL's language usage is important. Inclusive language that signifies the SIL as part of the process contributes to creating trust and co-ownership of the process. The SIL needs to show support for and value students' contributions so that they can build confidence in the significance of their contributions as part of the teaching–learning interaction. SIL3's frequent negative remarks had a limiting effect on the level of student trust and consequently their rate of participation. Extract 18 is an example of a negative way in which SIL3 tried to encourage interaction.

According to Cohen (1994) three types of talk is required in collaborative learning groups: talk between learners, tutorial talk and reflective talk (through inner speech, that is, thinking, writing or reading). Talk between learners occurs when the SIL retreats into the background so that the students may occupy centre stage. Thus an awareness of the need to create space for students to talk to each other is paramount. The SIL's role needs to be primarily an orchestrating and scaffolding role, rather than a directive one.

In all three sessions, the SILs maintained a high level of participation. This high participation rate was not always beneficial in helping students to learn. SIL1's mode of facilitation seemed to be most successful in ensuring participation and deep engagement in the material from the students.

6.3 The SIL's mediation style

In the three sessions analysed for this study three distinct mediation styles were isolated. These can be described as *enabling* (SIL1), *providing* (SIL2) and *interrogating* (SIL3). In Session 1 the enabling style was characterised by the SIL participating slightly less than the students; the SIL paid much attention to process management and facilitating cognitive engagement by students. Over 50% of the SIL's inputs related to process management. This included attention paid to the tasks (See Table 16 and 18). The student inputs in this session that exceeded that of the SIL and reflect the degree to which the students engaged with the tasks were the following forms of the elements:

IF: disagree, elaborate, explain, inform, justify, query, request assistance, and suggest.

C: class memory, example, fact, interpretation, opinion, and reflection.

UF: contribution, individual needs.

SIL1's mode of facilitation allowed students to adopt a high level of responsibility for the learning process (see Table 19). They spent more or less equal effort on managing the process and engaging in teaching-learning aspects of the session. This learner autonomy is important for a successful peer collaborative process.

SIL1 maintained the delicate balance between fellow student, group leader and facilitator, and tutor. For the better part of the session SIL1 maintained his role as near-peer. There was one instance where SIL1 adopted a traditional teacher mode, using traditional teacher discourse like, "I have drilled into everybody". At this point in the session it was clear that students suspended their attention. They did not make eye contact with SIL1 nor with each other.

However, SIL1 soon realised the problem and steered the proceedings into more productive terrain.

The SIL with the providing style (SIL2) spent the largest proportion of the cognitive engagement activities by providing much of the input, rather than allowing the students to do the work. The contributions of the students that exceeded those of the SIL indicate that their engagement was limited were the following forms of the elements:

IF: inform

C: fact, opinion, example, and problem

UF: contribution

SIL2 modeled the process of reflecting on content. The session was dominated by her interpretations of the content presented by the two students who had prepared for the session. This may have had benefits for the students, in that it provided them with a model of how one could think about the work. However, it provided limited scope for discussion among students.

If SIL2 had made it clear what she was doing and then asked the students to demonstrate how they would interpret information, the strategy would have had more value. Only students who had the ability and the inclination to critically reflect on the *process* they had been through in the SI session would have been able to derive that kind of value from the session. For others it was an opportunity to hear the information a second time after the lecture.

Although there were instances of peer talk and peer collaboration in answering questions and clarifying concepts, this was limited. The structure of a session intimately influences the way

in which the session tasks are perceived. Limited opportunities for joint productive activity, cognitive controversy and elaborated responses to answers were created by the structure of the task and the providing mediation style of SIL2. It seemed, though, from their body language and their facial expressions as if they were interested in the proceedings. Thus these students may have learned from a position on the periphery of the activities.

SIL 3's interrogating style contributed the highest percentage of interactions and operations, most of which were questions requesting or inviting students to participate. Again, the types of inputs by the students that exceeded those of the SIL indicate the shallow level of student engagement were the following forms of the elements.

IF: inform

C: fact, interpretation

UF: contribution

Initial dominance by SIL3 and the framing of frequent puzzle-type questions created expectations that were contrary to the spirit of peer collaboration. Minimal cognitive and emotional investment were made as a result. This was further highlighted by the fact that no questions relating to the development of an understanding of the content material of the essay writing process were asked during the session. There were also no instances of student initiation of tasks or any peer collaboration.

Another factor that influenced participation and thus the level of activity was SIL3's attitude during the session. SIL3 allowed her previous experiences with non-participating students to influence her approach to this session. Students' seats were far apart and the students' body

language indicted that there was no group cohesion. However, the students did show some willingness to engage during the initial stages of the session, but this was soon dissipated as a result of factors such as the task and SIL3's mediation style which was interrogating rather than inviting or enabling and the fact that the task was not negotiated with the group at the start of the session to ensure that it would serve their needs at the time. Thus the development and maintenance of positive relationships with SI students is important for ensuring productive learning groups. An atmosphere where students are able to have fun contributes to their learning. This was lacking in Session 3, in contrast to Session 1 where intermittent moments of light relief created a positive atmosphere.

6.4 SIL's role in the enculturation process

The SIL plays a pivotal role in the apprenticeship relationship with students. As the more competent other in the peer collaborative situation the SIL's task is to guide and share her experience. The three SILs in the study did this mainly through sharing strategies like study skills, problem solving strategies and through opening up opportunities for metacognitive awareness. SIL2 did this through demonstrating the development of a concept map while the two students were sharing their summaries of the sections of a chapter. SIL3 shared how she would approach an essay. SIL1 showed the students how the tests could be used to help them to solve a Legal Theory problem.

The role of the students in the apprenticeship relationship is on the plane of *participatory appropriation*. Participatory appropriation refers to how students change through their involvement in cultural activities. (See Chapter Two for more discussion on participatory

appropriation and the apprenticeship model of learning.) This is achieved through active involvement in the peer collaborative process. It is difficult to cite examples of participatory appropriation within the course of a single SI session. However, I think it is safe to assume that students learn ways of thinking about concepts, ways of questioning, solving problems, and using language as a result of their participation with others in the SI context. Students in Session 1 learned how an SI session was conducted: problems were set, questions asked and the group participated together to present solutions. Thus they were able to participate at a relatively deep level in the process. A very simplistic example of appropriation occurred in Session 2 where S5 after experiencing the way in which the SIL interpreted every contribution by a student, paused after his initial interaction and asked whether she wanted to "expansiate" (sic).

7. The role of the students

SI is a voluntary programme and therefore requires an internal locus of control from students. This personal responsibility for one's own learning needs to be extended beyond getting oneself to the SI session, to becoming actively involved in the teaching-learning process. Not all students take on this responsibility.

7.1 Participation and commitment to the peer collaborative process

Students' commitment influences their ability to participate and make useful contributions to the teaching-learning process. Students need to be at ease with the idea of participating and they need to be willing to do so. Their willingness to participate is influenced by, amongst

other things, how secure they feel in the teaching-learning environment. This, in turn, is influenced by their experiences in similar teaching-learning situations. In the Department of Law students participated in weekly tutorials where they were expected to be actively involved in group discussions. At least one of the Legal Theory 1 lecturers promoted active involvement of students in his lectures. The group who participated in Session 1 were regular SI attendees who were at ease with each other, used to the process of participation and sharing responsibility for the success or failure of the session. There was thus a culture of participation in the department and among the students involved. Students were able to transfer their tutorial experience to the SI setting.

During Session 1 all the students made inputs and five out of the seven students contributed extensively to the discussion. The two students who sat next to SIL 1 and thus out of his direct line of sight, contributed minimally, but were still involved on the periphery, following the discussions. They were able to contribute meaningfully when called upon. There was plenty of opportunity for students to verbalise and practise legal terminology as well as process information. Students were all involved in giving and receiving elaborated explanations. This, according to Webb (1982), is beneficial to academic achievement. All students in the group participated in the joint productive activity of discussion and problem solving. In this session the beneficial kinds of talk, that is, talk between learners where they share expertise and ignorance and tutorial talk, where they benefit from more expert guidance from the SIL were present. It is, of course, difficult to gauge the extent to which reflecting through inner speech occurred.

In contrast, the Department of Psychology, at the time when Sessions 2 and 3 were recorded, offered only eight tutorials during the year. At the time of recording the students had had six of the tutorials – three during the first semester and the rest during the second semester. These tutorials focused primarily on preparing students for the essays and other writing tasks they had to write during the year. In addition, the lecture classes were big and few lecturers stimulated discussion during lectures. Approximately 75% of students in Session 2 became regular attendees during the second semester only. They therefore did not have a history of collaborative learning. The students in Session 3 attended SI intermittently when they experienced problems with the course content.

7.2 Levels of participation and perceived authority

Many of the students in Psychology SI came from an educational background that left them underprepared for university study. Seizing authority within a teaching-learning environment was new to these students. However, it needs to be borne in mind that black students come from a culture with a "cooperative social orientation" and thus have the potential to "experience greater academic success in cooperative classes in comparison to whole class competitive classrooms" (Mkhabela, 1996, p. 143). Mkhabela notes that the South African black classroom is largely dominated by teacher centred approaches, and most students get to university without having been exposed to effective study skills programmes. She suggests that black students do not have opportunities to "apply their everyday life communal orientation to academic situations" (1996, p.143).

There is thus a serious disjunction between students' life experiences in their home communities and their experiences in educational settings. Ways need to be found to access students' cooperative skills and make them feel secure enough to risk exposure in a collaborative learning context. The aims and procedures of collaboration in the classroom should be made explicit and practised as part of the SI process, especially when students are new to it.

In addition, it is important to help students make the connections between the work and their own lives; thus engaging students affectively as well as cognitively with their learning. In Session 1 there were instances where students tried to generate examples that would help put themselves in the shoes of people experiencing the legal problems they were aiming to solve in their SI session. SIL2 linked what the students were doing in the session to students' personal learning and study needs. For example, she reflected on students' experiences in a previous SI session where they generated strategies to deal with difficult course content. She also used the course content in Session 2 to offer personalised, real-life examples of students' learning lives.

7.3 Participation and perceived status

Their perceived status or how students themselves perceive their status influences participation patterns in peer collaborative groups. Cohen's (1994) research discussed in Chapter Three shows that high status students contribute more than low status students. In the Rhodes University context status is determined by whether a student belongs to the majority or minority culture. Hunt's (1997) research found that males, white students, English first

language speakers and black students who attended private or former model C schools were perceived to have higher status within the academic milieu by other students. These students participated more frequently than students whose perceived status was lower. The majority of the students at Rhodes University are white, English speaking students with relatively good academic backgrounds.

Black students from former model C or private schools are perceived to have a higher status than students from the former Department of Education and Training (DET) schools (Hunt, 1997). DET schools were designated for black pupils during the time of National Party government. It is clear from the interaction patterns in the SI sessions that these status divisions apply. In Session 1 all the participants were either high achieving students or came from the dominant communities on campus and were therefore very vocal. There were three black students in that group – one came from a private school and the other two were Zimbabwean students who had achieved A-levels. In Session 2 few students were very vocal. The vocal students had confident dispositions and were average academically, rather than poor. All the students in that Session 2 came from former DET schools. Session 3 had a mixed group of students. The most vocal students in that group were the males. The group consisted of four males (two whites) and three females (all black). The most vocal male student was white. An important contributing factor to student silence in this group had to do with SIL 3's dominance. Hunt (1997) found similar patterns in her study of the interaction patterns in first year tutorial group at Rhodes University. Her study focused on the effects of gender, race, and home language on the rates of participation in tutorial groups.

7.4 Student contributions to the peer collaborative process

The data indicates that where students perceive themselves as having the authority to contribute to the learning process, the potential for learning interactions is high. Students in Session 1 and to a limited extent in Session 2, made contributions that resulted in cognitive conflict and the resolution of the conflict through elaborated responses from fellow students and SILs. Attention was paid to metacognition as well as epistemic cognition.

8. Conclusion

The findings of this research are that SI as a peer collaborative process does have the potential to influence student learning positively. However, the right conditions need to prevail. These conditions include an appropriate mediation style on the part of the SIL; tasks that are structured for participation by the largest possible number of students in the group; students who are able and willing to contribute to their own and fellow students' learning.

These findings indicate salient areas on which SI leader training needs to focus. The research also indicates that SI students need to be made aware of the potential influence of their participation or lack of participation on their learning and development. One of the ways in which the silencing and limiting effects of student status can be neutralised is to make students aware of its influence on their learning. Thus, attention needs to be paid in SI to helping students to reflect on all aspects of the teaching-learning process, including the role they play in the process.

CHAPTER EIGHT

CONCLUSION

1. Peer collaborative learning – possibilities and limitations

In this research I investigated the processes of peer collaborative learning in SI groups at Rhodes University. I was concerned with understanding the processes that enhanced or inhibited learning-teaching. The research findings indicate that SI has the potential to mediate learning in a qualitatively different way to tutorials and lectures. The process is dependent on a number of key variables such as the mediation skills and style of the leader, the choice of tasks and the level and extent of student contributions to the process.

Students seem to group themselves in more or less homogenous groups in relation to their academic background, but not necessarily in terms of levels of competence. Academically able groups like the law students exploit the full potential of the peer collaborative process. They are able and willing to participate. For students who are academically underprepared, the position seems different. There is a focus on lower levels of cognitive engagement as students struggle to develop content knowledge of the discipline. Also, these students do not participate willingly. SI leaders struggle to get them to take responsibility for the activities in the session. This is borne out by Blunt (1998) who suggests that SI at the University of Port Elizabeth has been less successful in engaging underprepared students than it has been in fulfilling the needs of more competent students.

According to SIL1 (personal communication, February 1999) it takes a longer period of intensive SI work before the level of interactions move to the metacognitive and epistemic

levels with poorer students. If, however, the focus on first level cognition is necessary, as Perkins *et al* (1993) suggest, then the SI context does serve a purpose in providing students with an informal, safe space to develop content knowledge.

Mkhabela (1996) noted that potentially, black students (who also make up the largest proportion of underprepared students at Rhodes University) could achieve greater academic success through collaborative learning, as their home environments tend to be communal. Theoretically, these students should find the collaborative learning context of SI beneficial. However, their experiences of the culture of school and classroom have caused them to see themselves as having little authority in the teaching-learning context. An explicit re-acculturation process in terms of the social construction of knowledge needs to be part of the SI experience for students in order to assure that all students derive the potential benefits of peer collaborative learning. Research by Clark (1998) and Koch & Mallon (1998) suggest that underprepared students prefer a more structured and directive approach to teaching-learning than the more informal, student-driven approach of SI.

In SI sessions students need to be given opportunities to reflect on their experiences within the peer collaborative context as well as on their learning in general. Thus, Johnson & Johnson's (1985, 1991) emphasis on the importance of the processing of (reflecting on) the group work seems to be supported by the findings of this research. SILs, then, need to be trained to be sensitive to the needs of all students and be able to lead students in the reflective process.

2. Generalizability of the research

It is likely that the findings of this research are generalizable to other types of small group teaching situations, such as small group tutorials where a student tutor facilitates the learning of students. Findings with regard to the nature and structure of tasks that are applicable to collaborative work in small groups, may be relevant for task design in tutorials. The findings about the facilitation styles which help or hinder student participation and autonomy may also apply. It seems important that attention be paid to the quality of interactions between group leaders, whether SILs or tutors, and their students. Putting students in groups with a group facilitator and a set of tasks does not necessarily guarantee that learning will occur.

This research has developed a means of evaluating the process of peer collaborative learning through a focus on the different aspects of activity, viz. the task, goals and interactions of the SI process. This means of evaluation may be applicable to other small group teaching-learning modes, such as tutorials, seminars and workshops within a university setting.

3. SI and assuring quality in teaching and learning

Voluntary, out-of-class peer collaborative learning classes such as SI offer students structured opportunities to interact with fellow students and senior students in order to learn about the demands of courses on different levels – at the level of learning content as well as engaging on the metacognitive and epistemic levels. It offers opportunities for students to engage in cognitive controversy that will help them to engage with their learning. In addition it offers students opportunities to take responsibility for their own learning.

A quality teaching and learning environment can be assured through the training and on-going development of SI leaders in terms of the aspects of mediating peer collaborative learning groups highlighted by this research. Students can play a more active role in assuring a quality learning experience by claiming authority and reflecting on their learning processes, including the peer collaborative process of SI. The SIL's role in facilitating quality teaching-learning in SI is paramount. SILs need to adopt a facilitative style that will promote high quality interactions by students.

This research indicates some areas to be focussed on in the training and development of SILs. These include:

- moving beyond training in basic facilitation skills, to include an in-depth look at how different facilitation styles may help or hinder a fruitful teaching-learning environment;

- focusing on the elements of joint productive activity, that is, the types of interactions that may lead to high quality peer collaborative learning and how the process may be facilitated by SILs and students;

- emphasising task design with a focus on how the structure of the task might influence the level and the extent of student engagement with the task;

- paying in-depth attention to the epistemic nature of the course with which the leader will work;

- emphasising the important role of metacognition in learning and how to structure opportunities for metacognitive engagement by students;

- developing sensitivity towards the potentially alienating effect learning groups may have on students who have not experienced high levels of active involvement in learning-teaching situations.

4. Further research

This study focussed on examining peer collaborative processes *in situ*. A shortcoming of the research design is that students and SI leaders did not have the opportunity to articulate their experiences of the collaborative processes for this study. This suggests a further area for research.

A second shortcoming of this study relates to the sampling. The sample was chosen as it represented examples of good, mediocre and poor SI sessions as viewed against the backdrop of the current theories on collaborative learning. A more extensive study that analyses a range of different kinds of SI sessions with an array of activities and interaction styles will yield valuable insights into the kinds of mediation practices that spawn successful collaborative learning. A typology of good mediation practices may result.

Another useful area of research would be to do longitudinal studies of specific SI groups for a year in order to investigate how the group processes and cognition levels develop and change as the students and the SIL become more adept at the SI teaching-learning process.

This research has highlighted the need for students to have a metacognitive awareness of their learning. Students need to be able to reflect on the teaching-learning process and their place in it. Only if they are able to do so successfully, will they be able to utilise the learning-teaching potential of peer collaborative groups. Action research projects that aim to develop students as reflective learners who are able to evaluate their own and others' performance in different

types of learning contexts, will help practitioners to find ways of improving the learning-teaching for students.

5. Final comments

The steps towards academic literacy are not giant ones. But as students participate in the various cultural activities of the institution, with the guidance of and in joint productive activity with fellow students, they become ever more confident steps. Each of the activities students participate in – lectures, tutorials, reading, writing essays, participating in SI groups, helps them to see in different ways, the path they must walk on the academic journey. This research has investigated how the process of peer collaboration in SI groups may facilitate the way students develop in their journey.

REFERENCES

Abercrombie, M.L.J. (1974). *Aims and Techniques of Group Teaching.* London: Society for Research in Higher Education.

Allen, V.L. (Ed). (1976). *Children as Teachers.* London: Academic Press.

Bargh, J., & Schul, Y. (1980). On the cognitive benefits of teaching. *Journal of Developmental Education, 16* (2), 12 – 18.

Barnes, D., & Todd, F. (1977). *Communication and Learning in Small Groups.* London: Routledge & Kegan Paul.

Bartholomae, D. (1985). Inventing the university. In M Rose (Ed). *When a Writer can't Write.* (pp. 34 – 165). New York: The Guildford Press.

Bernstein, B. (1964). Social class and Psychotherapy. *British Journal of Sociology 15*, pp. 54 – 64.

Bernstein, B. (1965). A socio-linguistic approach to social learning. In J. Gould (Ed). *Penguin Survey of the Social Sciences.* Harmondsworth: Penguin.

Bernstein, B. (1970). A socio-linguistic approach to socialisation. In J. Gumpers & D Hymes (Eds). *Directions in Socio-Linguistics.* New York: Holt, Rinehart & Winston.

Bloom, B.S. (Ed). (1956). *Taxonomy of Educational Objectives. Handbook 1: Cognitive Domain.* New York: Mc Kay.

Blunt, R.J.S. (1998). Generating capacity for academic transformation: a case study. *South African Journal of Higher Education 12* (3), 102 – 109.

Bosworth, K. (1994). Developing collaborative skills in college students. In K. Bosworth & S.J. Hamilton (Eds). *Collaborative Learning: Underlying Processes and Effective Techniques* (pp. 25 – 31). New Directions for Teaching and Learning No 59. San Francisco: Jossey Bass.

Boughey, C. (1994). New meanings for old words: defining and developing academic literacy at South African universities. *SAAAD Conference proceedings* (pp. 22 – 29). University of Natal. Durban.

Boughey, C. (1995). The rise and fall (?) of the study skill myth. *Discourse 6* (2), 7-14.

Boughey, C. (1997). Multiple metaphors in an understanding of the acquisition of academic literacy. University of Zululand. In *Proceedings of the 12th Annual Conference of the South African Association for Academic Development.* Broederstroom.

Boughey, C. (1998). Language and "disadvantage" in South African institutions of higher education: Implications of critical challenges to second language acquisition discourses for academic development practitioners. *South African Journal of Higher Education 12* (1), 166 – 173.

Boughey, C., & Van Rensburg, V. (1994). Writing to learn in Occupational Therapy. In *AD Dialogues 2*. Academic Development Centre. Bellville: University of the Western Cape.

Brice Heath, S. (1983). *Ways with words: Language, life and work in communities and classrooms.* Cambridge: Cambridge University Press.

Bronckart, J-P. (1995). Theories of action, speech, natural language, and discourse. In J.V. Wertsch, P. Del Río & A. Alvarez (Eds). *Sociocultural Studies of Mind* (pp. 75 – 91). Cambridge, MA: Cambridge University Press.

Brookfield, S.D. (1985). *Becoming a Critically Reflective Teacher.* San Francisco: Jossey Bass.

Brophy, J., & Alleman, J. (1991). Activities as instructional tools: A framework for analysis and evaluation. *Educational Researcher, 20* (4), 9 – 23.

Brown, J.S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, *18*, 32-42.

Bruffee, K.A. (1992). Collaborative learning and the "Conversation of Mankind". In A. Goodsell, M.R. Maher, V. Tinto, B.L. Smith & J. MacGregor (Eds). *Collaborative Learning: A Sourcebook for Higher Education* (pp. 23 - 33). University Park, PA: NCTLA. Pennsylvania State University.

Bruffee, K.A. (1993). *Collaborative learning. Higher Education, Interdependence, and the Authority of Knowledge.* Baltimore: Johns Hopkins University Press.

Chaiklin, S. & Lave, J. (Eds). *Perspectives on Activity and Context.* Cambridge, MA: Cambridge University Press.

Chang, G.L., & Wells, G. (1987). The literate potential of collaborative talk. Paper presented at the meeting of the International Oracy Convention, Norwich, England.

Clark, C. (1998). Research report on the Economics first year course 1998. Student perceptions. Unpublished report. Centre for Organisational and Academic Development. Port Elizabeth: University of Port Elizabeth.

Cohen, E.G. (1994). Restructuring the classroom: Conditions for productive small groups. *Review of Educational Research, 64* (1), 1-35.

Cohen, L., & Manion, L. (1994). *Research Methods in Education. Fourth Edition.* London: Routledge.

Congos, D.H., & Schoeps, N. (1993). Does Supplemental Instruction really work and what is it anyway? *Studies in Higher Education, 18* (2) 165 – 176.

Connole, H. (1998). The research enterprise. In H. Connole, B. Smith & R. Wiseman. *Issues and Methods in Research. Study Guide.* Deakin University.

Craig, A.P. (1988a). Excellence in and through Education. *South African Journal of Higher Education, 2* (1), 3 – 8.

Craig, A.P. (1988b). On the method of analysing human transactions recorded on video. *South African Journal of Psychology 18* (3), 96 – 103.

Craig, A.P. (1989). The conflict between the familiar and the unfamiliar. *South African Journal of Higher Education, 3* (1), 166 – 172.

Davies, E., & Vorster, J. (1994). The SI leader as a teaching resource. In *Proceedings of the SAAAD Conference. Volume 1.* (pp.165 - 174) Durban: University of Natal.

Davydov, V.V., & Kerr, S.T. (1995). The influence of L.S. Vygotsky on education: Theory, research, and practice. *Educational Researcher 24* (3), 12 – 21.

Dison, L., & Rule, P. (1996). Bridging the subject-student divide: An integrated approach to developing foundation curricula. *Academic Development*, *2* (2) 83 – 97.

Dison, A. (1997). *Crossing Boundaries: Facilitating Conceptual Development in Relation to Culture in an English for Academic Purposes Course*. Unpublished MA thesis. Grahamstown: Rhodes University.

Drewett, M.D. (1993). *The Integration of Academic Skills / Support Programmes into University Department Structures: A Case Study in the Sociology of Education.* Unpublished MA thesis. Grahamstown: Rhodes University.

Driscoll, M. (1982). *Research within Reach: Secondary School Mathematics.* A research-guided response to the concerns of educators. ED 225 842.

Durling, R., & Schick, C. (1976). Concept attainment by pairs and individuals as a function of vocalization. *Journal of Education Psychology 68*, 83 – 91.

Entwistle, N. (1997). Contrasting perspectives on learning. In F. Marton, D. Hounsell, & N. Entwistle (Eds). *The Experience of Learning. Implications for Teaching and Studying in Higher Education.* Edinburgh. Scottish Academic Press.

Finkel, D.L., & Monk. (1992). Teachers and learning groups: Dissolution of the Atlas Complex. In Goodsell, A., Maher, M.R., V. Tinto, B.L. Smith & J. MadGregor (Eds). *Collaborative Learning: A Sourcebook for Higher Education* (pp. 50-58). University Park, PA: NCTLA. Pennsylvania State University.

Fletcher, B. (1985). Group and indicidual learning of junior high school children on a micro-computer-based task. *Educational Review, 37,* 252 – 261.

Gilbert, A. (1995). Small voices against the wind: local knowledge and social transformation. Paper presented at the Fourth International Symposium on the Contributions of Psychology to Peace, University of Cape Town.

Goodlad, S., & Hirst, B. (1989). *Peer Tutoring: A Guide to Learning by Teaching*. London: Kogan Page.

Goodsell, A.S., Maher, M.R., Tinto, V., Smith, B.L., & MacGregor, J. (1992). *Collaborative Leaning: A Sourcebook for Higher Education.* University Park, PA: NCTLA. Pennsylvania State University.

Grayson, D.J. (1997). A holistic approach to preparing disadvantaged students to succeed in tertiary science studies. Part II: Outcomes of the Science Foundation Programme. *International Journal of Science Education 19,* 107 - 123.

Griffin, P., & Cole, M. (1984). Current activity for the future: The zo-ped. In B. Rogoff & J.V. Wertsch (Eds). *Children's learning in the "Zone of Proximal Development"* (pp. 45-64). San Francisco: Jossey Bass.

Hendricks, M., & Quinn, L. (1998). Use of sources in student writing: A case study. In *Conference proceedings of the South African Association of Applied Linguistics.* University of Natal.

Hillman, J.C., & McCarthy, A.J. (1996). Supplemental Instruction: Facilitating student participation in the learning process. In *Proceedings of the Student Contributions to Learning Conference. Selected Papers* (pp. 97 – 103). Grahamstown: Rhodes University.

Hunt, S.A. (1997). *An Investigation into Patterns of Iinteraction in Small Teaching Groups at Rhodes University, with Particular Emphasis on the Effect of Gender, Mother-Tongue and Educational Background.* Unpublished MA thesis. Grahamstown: Rhodes University.

Jaques, D. (1984). *Learning in Groups*. London: Kogan Page.

Johnson, D.W., & Johnson, R.T. (1985) The internal dynamics of cooperative learning groups in R.Slavin, S. Sharan, S.Kagan et al. (Eds). *Learning to Cooperate, Cooperating to Learn* (pp. 103-124). New York: Plenum Publishing.

Johnson, D.W., Johnson, R.T., & Smith, K.A. (1991). *Cooperative learning: Increasing College Faculty Instructional Productivity.* ASHE Higher Education Report No.4. Washington. George Washington School of Education and Human Development.

Jones, D.J., & Watson, B.C. (1990). *High-risk Students and Higher Education: Future Trends.* Washington D C: George Washington University.

Kitchener, K.S. (1983) Cognition, metacognition, and Epistemic cognition. A three–level model of cognitive processing. *Human Development*, *26*, 222 - 232.

Klausmeier, H., and Associates. (1979). *Cognitive Learning and Development: Piagetian and Information-processing Perspecitives.* Cambridge, MA: Ballinger.

Knight, G.P., & Bohlmeyer, E.M. (1990). Cooperative learning and achievement: Methods for assessing causal mechanisms in S. Sharan. (Ed). *Cooperative Learning: Theory and Research* (pp. 1 - 22). New York: Praeger.

Koch, E. (1996). The relationship of attendance of Supplemental Instruction with the performance of first year students at the University of Port Elizabeth. *Proceedings of the Student Contributions to Learning Conference. Selected Papers* (pp. 104 - 127). Grahamstown: Rhodes University.

Koch, E., & Mallon, P. (1998). Evaluation of Supplemental Instruction: a performance assessment approach. *South African Journal of Higher Education, 12* (3), 173 – 178.

Kounin, J. (1970). *Discipline and group management in classrooms.* New York: Holt, Rinehart & Winston.

Kuh, G.D., Douglas, K.B., Lund, J.P., & Ramin Gyurnek, J. (1994). *Student learning outside the classroom: Transcending artificial boundaries.* ASHE Higher Education Report No. 8. Washington D.C: George Washington University, School of Eduction and Human Development.

Lawton, D. (1972). *Social Class, Language and Education.* London: Routledge and Kegan Paul.

Laurillard, D. (1993). *Rethinking university teaching*. London: Routledge.

Lave, J. (1993). The practice of learning. In S. Chaiklin, J. Lave (Eds). *Perspectives on activity and context* (pp. 3 - 32). Cambridge: Cambridge University Press.

Lazarus, J., Miller, R., Moll, I., & Slonimsky, L., & Craig, A.P. (1989). New students in old universities: cognitive development in the South African tertiary educational context. *South African Journal of Higher Education, 3* (1), 153 – 172.

Lincoln, Y.S., & Guba, E.G. (1985). *Naturalistic Inquiry.* Newbury Park: Sage Publications.

Louw, D.A., & Edwards, D.J.A. (1993). *Psychology. An Introduction for Students in Southern Africa.* Isando: Lexicon Publishers.

MacGregor, J.T. (1992). Collaborative learning: Reframing the classroom. In A.S. Goodsell, M.R. Maher, V. Tinto, B.L. Smith & J. MacGregor (Eds). *Collaborative learning: A Sourcebook for Higher Education* (pp. 37 - 40). University Park, PA.: NCTLA. Pennsylvania State University.

Martin, D.C. & Arendale, D.R. (1990). *Supplemental Instruction: Improving Student Performance, Increasing Student Persistence*. Kansas City, MO: University of Missouri-Kansas City.

Marton, F., Hounsell, D., & Entwistle, N. (Eds). (1984). *The Experience of Learning. Implications for Teaching and Studying in Higher Education.* Edinburgh: Scottish Academic Press.

Marzano, R.J. (1991). Fostering thinking across the curriculum through knowledge restructuring. *Journal of Reading, 34* (7), 518 – 525.

Maxwell, J.A. (1990). Understanding and validity in qualitative research. *Harvard Educational Review, 60,* 279 – 297.

McCarthy, A., Smuts, B., & Cosser, M. (1997). Assessing the effectiveness of Supplemental Instruction: a critique and a case study. *Studies in Higher Education*, *22* (2), 221 – 231.

Miller, R. (1989). Conceptual issues in theorising about cognition. *South African Journal of Higher Education, 3* (1), 154 – 160.

Mkhabela, O.K. (1996). The effects of scripted co-operative learning approach on academic achievement of black South African first-year students. In *Proceedings of the Student Contributions to Learning Conference*. *Selected Papers* (pp. 142 - 154). Grahamstown: Rhodes University.

Moll, I., & Slonimsky, L. (1989). Towards an understanding of cognition and learning in the academic support context. *South African Journal of Higher Education, 3* (1), 160-166.

Moll, L. (Ed). (1990). *Vygotsky and Education. Instructional Implications and Application of Sociohistorical Psychology.* New York: Columbia University Press.

Nelson, C.E. (1994). Critical thinking and collaborative learning. In K. Bosworth & S.J. Hamilton (Eds). *Collaborative Learning: Underlying Processes and Effective*

Techniques (pp. 45 – 58). New Directions for Teaching and Learning No. 59. San Francisco: Jossey Bass.

Newman, D., Griffin, P., & Cole, M. (1989). *The Construction Zone*. Cambridge, MA: Cambridge University Press.

Nijhof, W., & Kommers, P. (1985). An analysis of cooperation in relation to cognitive controversy in R. Slavin, S. Sharan, S. Kagan. (Eds). *Learning to Cooperate, Cooperating to Learn* (pp. 125-145). New York: Plenum Publishing.

Northedge, A. (1994). Access Initiation Into Academic Disclosure. Great Britain: Open University.

Pascual-Leone, J. (1991). Commentary. *Human Development*, *32*, 288 – 293.

Pascal-Leone, J. (1995). Learning and development as dialetical factors in cognitive growth. *Human Development, 38,* 338 - 348.

Perkins, D., Jay, E., & Tishman, S. (1993). New concepts of thinking: From ontology to education. *Educational Psychologist, 28*, 17 - 85.

Perry, W.G. Jr. (1970). *Forms of Intellectual and Ethical Development in the College Years*. New York: Holt, Rinehart and Winston.

Ratner, C. (1997). *Cultural Psychology and Qualitative Methodology*. *Theoretical and Empirical Considerations*. New York: Plenum Press.

Resnick, L.B. (1987). *Education and Learning to Think*. Washington, D.C: National Academy Press.

Resnick, L.B., Levine, J.M., & Teasley, S.D. (1991). *Perspectives on Socially Shared Cognition* Washington: American Psychological Association.

Rogoff, B. (1990). *Apprenticeship in Thinking. Cognitive Development in Social Context.* New York: Oxford University Press.

Rogoff, B. (1995). Observing sociocultural activity on three planes: participatory appropriation, guided participation, and apprenticeship. In J.V. Wertsch, P. Del Rio, & A. Alvares (Eds). *Sociocultural Studies of Mind* (pp. 139-164). Cambridge: Cambridge University Press.

Rogoff, B., & Wertsch, J.V. (Eds). (1984). *Children's Learning in the "Zone of Proximal Development"*. San Francisco: Jossey-Bass.

Rumelhart, D.E., & Norman, D.A. (1981). Accretion, tuning and restructuring: three modes of learning. In J.W. Colton & R. Klatzky (Eds). *Semantic Forms in Cognition.*

RSA (1995). "South African Qualifications Authority Act (Act No. 58 of 1995)." *Government Gazette* No. 1521 (4 October). Pretoria: Government Printer.

Säljo, R. (1979). *Learning in the Learner's Perspective. Some Common-sense Conceptions.* Reports from the Department of Education. Goteborg: University of Goteborg.

Sampson, N., Vorster, J., Burton, S., & Collet, P. (Eds). (1999). *Active Learning. A Practical Guide for Tertiary Educators.* Grahamstown: Australia-South Africa East Cape Links Project.

Schwartz, D.L., Black, J.B., & Strange, J. (1991). Dyads have a fourfold advangtage over individuals inducing abstract rules. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago.

Scribner, S. & Cole, M. (1973). *Culture and Thought: A Psychological Introduction.* New York: John Wiley.

Sharan, S. (Ed). (1990). *Cooperative Learning: Theory and Research.* New York: Praeger.

SI Leader Manual (1995). Kansas City: University of Missouri – Kansas City.

Slavin, R.E. (1980). Cooperative learning. *Review of Educational Research 50,* 2, 315 – 342.

Slavin, R., Sharan, S., Kagan, S., Lazarowitz, R.H., Webb, C., & Schmuck, R. (Eds). (1985). *Learning to Cooperate, Cooperating to Learn*. New York: Plenum Publishing.

Smith, B.L., & MacGregor, J.T. (1992). What is collaborative learning. In A.S. Goodsell, M.R. Maher., V. Tinto., B.L. Smith., & J. MacGregor (Eds). *Collaborative Learning: A Sourcebook for Higher Education.* (pp. 9 – 22). University Park, PA.: NCTLA. Pennsylvania State University.

Smuts, K.B. (1996). Supplemental Instruction in Law: A case study. In *Proceedings of the Student Contributions to Learning Conference. Selected Papers* (pp. 128 – 141). Grahamstown: Rhodes University.

Splitter, L.J. (1991). Critical thinking: what, why when and how. *Journal of Educational Philosophy and Theory 23* (1), 89 – 108.

Starfield, S. (1994). Multicultural Classrooms in Higher Education. *English Quarterly, 26* (3), 16 - 21.

Swing, S., & Peterson, P. (1982). The relationship of student ability and small-group interaction to student achievement. *American Educational Research Journal, 19,* 259 – 274.

Taylor, G., Ballard, B., Beasley, V., Bock, H.K., Clanchy,J., & Nightingale, P. (1988). *Literacy by Degrees.* Milton Keynes: SRHE and Open University Press.

Tharp, R.G. (1997). From At-Risk to Excellence: Research, Theory, and Principles for Practice. Center for Research on Education, Diversity, & Excellence. Research Report 1. Santa Cruz: University of Carlifornia, Santa Cruz.

Topping, K. (1997). The effectiveness of peer tutoring in further and higher education: A typology and review of the literature. In S. Goodlad (Ed). *Mentoring and Tutoring by Students* (pp. 49 – 69). London: Kogan Page.

Treisman, U. (1986). *A Study of the Mathematics Performance of Black Students at the University of California, Berkeley.* Dissertation Abstracts International, 47, 1641A.

Tudge, J. (1990). Vygotsky, the zone of proximal development, and peer collaboration: Implications for classroom practice. In L. Moll (Ed). *Vygotsky and Education. Instructional Implication and Application of Sociohistorical Psychology* (pp. 155-171). New York: Columbia University Press.

Van der Riet, M.B. (1993). *Mediation and the Nature of Cognitive Socialization in the Creche and the Home in a Black Rural Context.* Unpublished MA thesis. Rhodes University.

Van Vlaenderen, H.R.M. (1997) *Group Problem Solving among Community Activists in a South African Setting: An Everyday Cognition Approach.* Unpublished doctoral thesis. Grahamstown: Rhodes University.

Vosniadou, S., & Brewer, W.F. (1987). Theories of knowledge restructuring in development. *Review of Educational Research 51* (1)*,* 51 – 67.

Vygotsky, L. (1978). *Mind in Society.* Cambridge, MA: Harvard University Press.

Webb, N.M. (1982). Student interaction and learning in small groups. *Review of Educational Research 52* (3), 421 – 445.

Webb, N.M. (1985). Student interaction and learning in small groups. A research summary in R. Slavin, S.Sharan, S.Kagan, et al. (Eds). *Learning to Cooperate, Cooperating to Learn* (pp. 147 - 172). New York: Plenum Publishing.

Webb, N., Ender, P., & Lewis, S. (1986). Student interaction and learning in small group and whole-class settings. In P.L. Petersen, L.C. Wilkinson, & M. Hallinan (Eds). *The*

Social Context of Instruction: Group Organization and Group Processes (pp. 153 – 170). Orlando: Academic.

Wells,G., Chang, G.L.M., Maher, A. (1990). Creating classroom communities of literate thinkers. In S.Sharan. (Ed). *Cooperative Learning: Theory and Research* (pp. 95 - 121). New York: Praeger.

Wertsch, J.V. (1984). The zone of proximal development: Some conceptual issues. In B. Rogoff & J.V. Wersch (Eds). *Children's Learning in the "Zone of Proximal Development* (pp. 7 - 18). San Francisco: Jossey Bass.

Wertsch, J.V. (1991). A Sociocultural approach to socially shared cognition. In L.B. Resnick, J.M. Levine & S.D. Teasley. *Perspectives on Socially Shared Cognition* (pp. 85 – 100) Washington: American Psychological Association.

Wertsch, J.V., Del Rio, P., Alvarez, A. (Eds). (1995). *Sociocultural Studies of Mind*. Cambridge MA: Cambridge University Press.

Wood, D.J. (1980). Teaching the young child: some relationships between social interaction, language, and thought. In D.R. Olson (Ed). *The Social Foundations of Language and Thought.* New York: Norton.

Wood D.J., Bruner, J.S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry 17* (2), 89 – 100.

Zuber-Skerritt,O. (1987). The integration of university student learning skills in undergraduate programmes. *Programmed Learning and Educational Technology, 24* (1), 62 – 70).

Appendix A

Reading guide 1

INTERACTIVE FUNCTIONS

TO CLARIFY	Attempting to make the meaning of conceptual content intelligible to others.
TO COMMENT	Making a statement to others about some aspect of a concept/ the task / group process (excluding rejection / support / query / justify.
TO INFORM	Providing (conceptual) facts to the group pertaining to the task or other.
TO QUESTION	Seeking clarification for others about certain conceptual data (including additional information) about the task / group process.
TO INVITE	Soliciting conceptual content from other(s) in function of solving a problem.
TO JUSTIFY	Providing arguments in favour of a position. Providing grounds for a claim to others.
TO ELABORATE	Providing additional information about something presented by another or subject.
TO PROBE	Soliciting more information / ideas about concept / problem with the aim of eliciting deeper thinking about something.
TO EXPLAIN	Providing conceptual information making clear the meaning of something.
TO QUERY	Indicating uncertainty about certain conceptual content.
TO REQUEST	Asking (proposing to) others for something to be done with regards to the task / group process.
TO REQUEST ASSISTANCE	A specific request denoting limited understanding and seeking assistance with of topic under discussion
TO RECORD	Making a written record or conceptual content.
TO DISAGREE	Indicating to others that one considers certain conceptual content or aspects of the task / group process unacceptable.
TO SUGGEST	To propose an idea in response to earlier inquiry or query. Not specific as in case of fact.

COGNITIVE –AFFECTIVE CONTENT

EXAMPLE	Illustration of concept for clarifying purposes.
FACT	Information provided in order to solve the problem.
INTERPRETATION	Specific understanding of the meaning of conceptual content.
OPINION	Personal belief / feeling.
REFLECTION	Verbalisation of occurring cognitive – emotive or behavioural process.
UNDERSTAND	Relates to whether the student/s follow and understand the process or task.
REPITITION	Re-occurrence of content of previous contributions.
STRATEGY	Information about (learning) strategies relating to the task or problem.
CONCEPT	Idea underlying notion.
CLASS MEMORY	Information about what was said in class – bears relation to the task.
PUZZLE	Question to which there is a specific, finite answer.
PROBLEM	An ill-structured question with no definitive answer.

UNDERLYING FUNCTION OF OPERATION

TASK — Promotion of any aspect of a task not included below.

DEVELOP CONCEPTUAL UNDERSTANDING (DCU) — Input with the aim of helping the group or an individual understand a concept.

AMPLIFY — Strengthening conceptual ideas to enhance acceptance by the group.

PARTICIPATION — Encouragement of conceptual contributions towards the solution of the problem.

CONTRIBUTION — Provision of the essential conceptual building blocks in direct function of the problem solving / task completion process.

DIRECTION — Contribution that seeks to change the direction of the proceedings, e.g. introduce new task.

INDIVIDUAL NEEDS — Contribution that seeks to fulfill personal need of participant, unrelated to the group process.

ENGAGEMENT — Encouragement of deeper engagement with the task / facilitates deeper thinking.

GROUP — Facilitating group dynamics / For the benefit of the group process.

ASSISTANCE — Group member asking for help with problem.

CONCEPT CLARIFICATION — Input made to help participants understand the meaning of specific concept.

INTERSUBJECTIVITY — Attempts to make sure that the everybody in the group is engaged in the same task.

LIGHT RELIEF — Input made specifically as a joke.

Appendix B: Transcript of Session 1, including description and application of Reading Guide 1.

Column 1: speaker; **column 2:** transcription; **column 3:** number of operation; **column 4:** thick description; **column 5:** label according to Reading Guide 1.

SIL1	Let's review the facts we drew together last week.	1	• SIL1 bring the group to order to start the session. • SIL1 invites contributions from the group. • SIL1 also wants to bring people who did not attend the previous week, into the picture. • SIL1 wants the group to get a picture of where they got to the previous week.	IF: Invite C: UF: Task
	Okay, who wants to start?	1.1	• SIL1 opens the floor to the group. • SIL1 invites participation. • SIL1 offers the group the choice to participate.	IF: Invite C: UF: Participation
	S1, do you want to start?	1.2	• SIL1 notices that S1 is ready to start. • SIL1 asks him if he would like to start.	IF: Invite C: UF: Participation
S1	We defined delict. Then we went to the elements of delict … interpretation.	2	• S1 lists what they did the previous session.	IF: Inform C: Fact UF: Contribution
SIL1	Does everybody understand the path that we followed?	3	• SIL1 asks if everyone understands the path they've been following. • SIL1 reminds them that they are working within a structure.	IF: Question C: Understand UF: Intersubjectivity
	Is everybody happy with it? If everybody happy with how far we are?	3.1	• SIL1 is still setting the scene. • SIL1 is trying to establish whether there is anything from the previous week which needs to be clarified. • SIL1 is also trying to establish intersubjectivity. • SIL1 is structuring the activity. • SIL1 seems to have a grand plan in his head.	IF: Question C: Repetition UF: Intersubjectivity
	We just got as far as elements.	3.2	• SIL1 re-establishes where they got up to the last time.	IF: Support C: Repetition UF: Intersubjectivity
SIL1	Where are we going to now?	3.3	• SIL1 tries to elicit direction from the group for the process of answering the task question.	IF: Question C: UF: Direction
S2	We have already expanded on the elements. We expanded up to wrongfulness.	4	• S2 further clarifies what they achieved in the last session. • She participates in the process of reaching intersubjectivity.	IF: Inform C: Fact UF: Contribution

SIL1	Ja, we expanded on the elements.	5	• SIL1 agrees with her information. • There seems to be general agreement in the group about the starting point for this session.	IF: Support C: Repetition UF: Intersubjectivity
	Who wants the next one?	5.1	• SIL1 asks who wants to contribute next. • SIL1 wants to move the action forward. • SIL1 wants to make sure there is turn taking. • SIL1 is still driving the structure. (*S3 begins to turn the pages of her file. This is an indication that she wants to connect with the action.*)	IF: Invite C: UF: Participation
S3	It's faults isn't it?	6	• Offers contribution. • S3 wants to establish whether she is on the right track.	IF: Question C: UF: Intersubjectivity
S4	Fault, blamefulness, accountability.	7	• S4 helps by agreeing and adding another point to consider.	IF: Inform C: Fact UF: Contribution
S3	With accountability you have to establish between accountability and the different forms of fault.	8	• S3 draws attention to an issue with accountability.	IF: Elaborate C: Fact UF: Contribution
SIL1	Can you help us with that ?	9	• SIL1 asks if S3 would like to help with different forms of fault. • SIL1 sees an opportunity to help them clarify their understanding of this.	IF: Request C: UF: Participation
S3	Okay, for the accountability you must find out what is the age of the children. At what age they can be held responsible. …*capex, napex*. And the different types of fault... *dolus*, is …. isn't it *international dolus, indirect dolus, …*	10	• S3 agrees to offer information on different types of dolus. • Relates important fact about accountability. • S3 queries what the different types of dolus are called in Latin. • SIL1 remains quiet during this interchange. He allows them to struggle with this issue.	IF: Explain C: Fact UF: Contribution
S1	That's for criminal law.	11	• S1 disagrees with S3's categorisation of *dolus* under *delict.* • S1 suggests that the correct categorisation is criminal law.	IF: Disagree C: UF: Contribution
S4	Ja, that's not part of *delict*.	12	• S4 agrees with S1 • They collaborate to try and figure out what the answer is.	IF: Support C: UF: Task
S1	XXX. In Austin they put it under criminal law. He put it under criminal law.	13	• S1 suggests that a textbook categorises dolus under criminal law. • S1 offers proof from the textbook.	IF: Inform C: Fact UF: Contribution

SIL1	It is for both. It is like a universal concept that follows through all parts of Law. So, ja.	15	• SIL1 clarifies the confusion (Epistemic cognition?) • SIL1 states that it is a universal law	IF: Clarify C: Fact UF: DCU
SIL1	For those who have read through Austin, well done.	15.1	• SIL1 congratulates their scholarly behaviour.	IF: Comment C: Opinion UF: Group
	Okay, does everybody understand what we're doing, where we're going?	15.2	• SIL1 asks if everyone understands the process they're going through.	IF: Question C: Understand UF: Intersubjectivity
	We're trying to formulate, not the perfect answer, but a good, well-structured answer to this question. Okay.	15.3	• SIL1 recognises that there may be some loss of the general focus. • SIL1 tries to bring them back to his original structure. • SIL1 explains what they are trying to do with this task. • Epistemic knowledge. This is what makes for good argument in Law.	IF: Comment C: Reflection UF: Intersubjectivity
S5	If we answer this in the exam, do we have to put down all these elements and expand on them?	16	• S5 is not ready to move on yet. • S5 takes control of where the discussion moves to now. • S5 asks metacognitive question re scope of exam answer.	IF: Question C: Strategy UF: Direction
SIL1	Very important.	17	• SIL1 acknowledges the importance of her query.	IF: Comment C: Opinion UF: Task
S3	You can get the answer wrong and you can still get six out of ten. (*general laughter*)	18	• S3 also acknowledges the importance of the query • S3 shares her experience / opinion regarding S5's question.	IF: Comment C: Reflection UF: Task
SIL1	That's ... if you look at the tests that people have written. Some of you have written tests where you did not know the answer, but you've set out all the different things and you got six, seven out of ten ... with a totally wrong answer. It's important things. Like doing a mathematical equation. You can write down where you're going and get the wrong answer!	19	• SIL1 suggests that it's strategic to not launch into an answer without preparing the ground for the answer. • They are listening, but do not look at SIL1. • Even though S3 mentioned the importance of getting the formula right, it seems as if they are not interested in hearing the whole story. • (Maybe they've heard him say this before?)	IF: Support C: Reflection UF: Amplify IF: Comment C: Strategy UF: Task
	It's very important that you don't snap straight into the answer.	19.1	• SIL1 emphasises the importance of following the formula.	
	I've drilled into everybody a set formula for answering these questions.	19.2	• SIL1 says that he has explained a set formula for answering questions many times.	IF: Comment C: Reflection UF: Task

	That is, a definition of the section you're doing. In this case it's *delict*. Then you go to the elements of *delict*. Just write them out, quickly state them.	19.3	• SIL1 mentions the first step of the formula. • SIL1 goes on to the next step. • Traditional teacher-talk.	IF: Inform C: Strategy UF: Task
	What's the next step?	19.4	• SIL1 asks group what the next step in the formula is. • SIL1 invites group back into the discussion.	IF: Question C: UF: Task
S2	Expanding with examples.	20	• S2 answers SIL1's question. • They say what the next step is.	IF: Inform C: Strategy UF: Contribution
SIL1	With examples. Examples being?	21	• SIL1 reflects their answer. • SIL1 probes for a more complete answer. • SIL1 is struggling to get participation going. The reason could be that he has not given them a clear enough structure content within which to work. They're grappling to find something useful to say.	IF: Probe C: Puzzle UF: Participation
S3	XXX. The story. The thing that stick in your mind.	22	• S3 suggests what might form part of examples.	IF: Inform C: Interpretation UF: Contribution
SIL1	The things that stick in your mind, like?	23	• SIL1 reflects what S3 has just said • SIL1 probes for an example of S3's suggestion.	IF: Probe C: UF: Engagement
S5	The one that we did yesterday.	24	• S5 tries to remember the case.	IF: Suggest C: Reflection UF: Contribution
S5	Like the students ... what was that student?	24.1	• S5 suggests that the case they did the previous day could be relevant to the present discussion.	IF: Question C: UF: Contribution
S4	(*Whispers to S3*) Can I get yesterday's notes from you?	25	• S4 asks for yesterday's notes from S3.	IF: Request C: UF: Individual needs
S2	Like the woman who ...	26	• S2 is still trying to offer an example.	IF: Suggest C: Example UF: Contribution
SIL1	That Stevenson case ...	27	• SIL1 suggests an appropriate example.	IF: Inform C: Example UF: Contribution
S2	You're talking about *delict* and you're giving a Criminal Law …	28	• Disagrees with the example.	IF: Disagree C: Reflection UF: Task
SIL1	Okay, like that.	29	• SIL1 agrees with something one of the students mentioned in connection with his original question about examples. •	IF: Support C: UF: Task

S2	Can I expand on ... Sorry, I forget your name?	30	• S2 asks permission to expand on something S3 had said earlier. • S2 asks S3's name. • S2 takes control. • S2 changes the direction from where SIL1's diversion was taking them.	IF: Question C: UF: Direction
S3	S3	31	• S3 gives her name.	IF: Inform C: Fact UF: Group
S2	S3. You know, when she was talking about fault ...	32	• S2 takes them back to the discussion on fault.	IF: Comment C: Reflection UF: Intersubjectivity
S2	Within fault they mention negligence and I found you have to mention the test for negligence because it's going to apply in you final answer.	32.1	• S2 suggests that in an answer where fault is under discussion, the test for negligence has to be mentioned. • S2 shares her understanding of the epistemic requirements of the question.	IF: Inform C: Reflection UF: Task
SIL1	Okay, what is the test for negligence?	33	• SIL1 acknowledges the change in focus of the discussion. • SIL1 asks the group what the test for negligence is.	IF: Question C: Puzzle UF: Task
S4	Foreseeable aspects and ... Okay ...	34	• S4 suggests an answer. • S4 thinks she knows part of the answer, but seems to think there is more to it.	IF: Inform C: Fact UF: Contribution
SIL1	And the case?	35	• SIL1 asks for the relevant case. • SIL1 reminds them of the importance to offer case law as evidence for their argument. • Epistemic issue.	IF: Probe C: Puzzle UF: Task
S4	Kruger vs. Kruger	36	• S4 suggests a case.	IF: Inform C: Fact UF: Contribution
S2	Houghton vs. Stone	37	• S2 offers a different suggestion.	IF: Inform C: Fact UF: Contribution
SIL1	Okay, we offer two. Kruger vs. Kruger ... (*General laughter from the group*)	38	• SIL1 suggest that two cases can be offered as examples. • The group finds that funny.	IF: Support C: Repetition UF: Task
S3 to S5	Coetzee vs. Coetzee is easy.	39	• S3 suggests that a different case may be easier.	IF: Comment C: Opinion UF: Contribution

S2	Ja, but you have to have it in.	40	• S2 states that it is important to have the test for negligence in the answer.	IF: Comment C: Opinion UF: Contribution
SIL1	The test, you have to put the test.	41	• SIL1 agrees with her that the test is important.	IF: Support C: Repetition UF; Task
	Okay, can everybody write that down? Does everybody know what they're going to write down? Is everybody sure where we're going?	41.1	• SIL1 wants to bring the group to the same point. Intersubjectivity. • SIL1 asks if they all understand the direction of the discussion.	IF: Question C: Understand UF: Intersubjectivity
S4	XXX. Foreseeable aspect, preventability of harm.	42	• S4 suggests where they are going. • Focuses the discussion on the task relating to fault.	IF: Inform C: Fact UF: Contribution
S2	If a reasonable person sees harm and takes steps to prevent it.	43	• S2 says what her understanding of preventability of harm is.	IF: Elaborate C: Fact UF: Contribution
S3	There are four steps: They ... if a person sees the foreseeability of causing harm to another person... The second step is whether a reasonable person has taken steps to guard against the conduct. What steps would a reasonable person have taken. Finally, did the defendant take those steps?	44	• S3 states that there are four steps. • S3 gives a breakdown of the steps.	IF: Inform C: Fact UF: Contribution
S5	The steps were modified to consider the personal attributes of the defendant and the circumstances of the defendant.	45	• S5 suggests another factor to be taken into consideration.	IF: Inform C: Fact UF: Contribution
SIL1	Can you give an example of that?	46	• SIL1 asks S7 next to him for an example of what S5 had mentioned. • S7 appeals across the table to S2 for assistance.	IF: Question C: Puzzle UF: DCU
S7	A surgeon.	47	• S7 gives an example.	IF: Inform C: Example UF: Contribution
SIL1	Okay.	48	• SIL1 agrees with example. • SIL1 waits for more.	IF: Support C: UF: Group
S1	Ja, there are different standards. If you're a specialist, there are higher standards set for you than that of any reasonable man. *(General agreement)*	49	• S1 elaborates. • The rest of the group indicate their agreement by nodding their heads and saying "ja".	IF: Elaborate C: Fact UF: Contribution
S2	He said something … XXX you're still of that profession.	50	• S2 remembers what the lecturer had said about the issue of specialists and accountability.	IF: Inform C: Class Memory UF: Contribution
S5	Ja, that's right.	52	• S5 agrees with S6.	IF: Support C: Repetition UF: Task

S2	So you guys are remembering from ... I'm happy you guys are remembering.	53	• S2 praises them for remembering.	IF: Comment C: Opinion UF: Group
SIL1	Are you okay? Does anyone want to offer a suggestion for what we do next?	54	• SIL1 enquires whether they are happy. • SIL1 asks for suggestions about the next step.	IF: Question C: Understand UF: Task
	Discuss the remedies?	54.1	• SIL1 offers a suggestion in the form of a question. • SIL1 offers the group the choice.	IF: Suggest C: UF: Task
S3	We haven't finished. We still have causation and loss to discuss.	55	• S3 indicates that they are not ready to move on yet. • S3 suggest that there are still issues to discuss about causation and loss.	IF: Comment C: Fact UF: Direction
S3	Well he just said what causation ...	55.1	• S3 indicates that they are not ready to move on yet. • S3 suggests that there are still issues to discuss about causation and loss. • S3 tells them what they have discussed.	IF: Inform C: Class Memory C: Contribution
SIL1	Do you want us to expand on that or is it? ...	56	• SIL1 asks them what hey want to do next. • SIL1 asks whether they want the group to expand on what they have done. • SIL1 offers direction, but gives them the choice.	IF: Question C: UF: Task
S2	We just highlight the causation.	57	• Suggests a path.	IF: Suggest C: UF: Contribution
S3	The causation between the conduct and the loss suffered. There must be a closely connected link, not a ...	58	• S3 defines more closely what they need to do next. • S3 reads in her notes that there needs to be a close link between causation and loss suffered.	IF: Elaborate C: Fact UF: Contribution
SIL1	Oh, you're reading it out, but do you understand?	59	• SIL1 challenges her. • SIL1 wants to know whether she understands what she is reading.	IF: Question C: Understand UF: Task
S3	Yes. (Nods)	60	• S3 is sure that she understands.	IF: Inform C: Fact UF: Task
SIL1	S5, do you understand causation?	61	• SIL1 asks S5 whether she understands the concept of causation.	IF: Question C: UF: Participation

S5	Ja, I mean, ja.	62	•	She says yes but does not seem sure.	IF: Inform C: Reflection UF: Task
SIL1	No, no, you must ...	63	• •	SIL1 picks up on her uncertainty. SIL1 gestures an invitation to say if she is not clear.	IF: Invite C: UF: Participation
SIL1	Could you offer an example?	63.1	• •	SIL1 asks S5 for an example of causation. SIL1 wants to establish the level of her understanding.	IF: Request C: Puzzle UF: Engagement
S5	Of causation? No.	64	•	S5 says she is unable to offer an example.	IF: Inform C: Fact UF: Task
SIL1	Offer an example we can relate to causation.	65	• •	SIL1 asks S6 for an example related to causation. SIL1 brings in the quiet students next to him.	IF: Request C: UF: Participation
S6	An example is drunken driving. He mentioned drunken driving that is a direct cause of an accident.	66	• •	S6 offers an example. S6 remembers an example the lecturer had given.	IF: Inform C: UF: Participation
S1	I remember Prof. saying you must ... If you harm a person and he goes to hospital and he is supposed ... he refuses to have a blood transfusion and he dies, then it's not your fault. So, it must relate directly to your action ... has direct cause. Not like if he goes to hospital and he refuses and he dies.	67	• • •	S1 elaborates on S6's suggestion. S1 relates an elaborated example of causation. S1 remembers what the prof. said about it.	IF: Elaborate C: Class Memory UF: Contribution
S2	And there is also a test for it.	68	•	S2 elaborates further by bringing the test for causation into the discussion.	IF: Inform C: Fact UF: Contribution
S2	But you see, this is where I want to know. There are just so many tests and so much to write. And I mean I understand. We're mentioning all aspects … causation and everything.	68.1	• •	S2 airs an issue she has with the many tests. S2 says she understands that it is a process and that the group is mentioning all aspects.	IF: Comment C: Interpretation UF: Task
	But would you have to go through the whole process?	68.2	• • •	S2's questions relate to whether the whole process is necessary when answering a question. This is an epistemological question – when to use and when not to use a test.	IF: Question C: Strategy UF: Task
SIL1	Did Prof. give you a test?	69	• •	SIL1 wants to suggest the strategic thing. In SIL11's experience, if the professor gives the test, it is important.	IF: Question C: Puzzle UF: Task

S2	There is a test.	70	• S2 states that a test exists.	IF: Inform C: Fact UF: Contribution
SIL1	Did he give it to you or did you find it in your XXX?	71	• SIL1 wants clarity on whether the prof. gave the test or whether they had read about it.	IF: Question C: Puzzle UF: Task
S3	No, he said that the test for actual causation was that *sine qua* …	72	• S3 says what the prof. stated as the actual test. • S3 struggles to say the Latin term.	IF: Inform C: Fact UF: Contribution
S2	*Sine qua non*	73	• S2 says the correct name.	IF: Inform C: Fact UF: Contribution
SIL1	*Sine qua non* …	74	• SIL1 repeats the name.	IF: Support C: Repetition UF: Task
S3	But for the bad conduct, whatever, ja.	75	• S3 states what it means.	IF: Explain C: Concept UF: Cont ribution
SIL1	What is important to remember is, the reason they give you these tests is: When you're answering a question if you're not sure of where to go, you can always rely on one of these tests that you know to answer. You tell yourself: What would the reasonable man have done? The same thing with this. It's important to know that in case you do get stuck. But, obviously, if they get too much for you, it's up to you whether you want to learn them. The entire …	76	• SIL1 suggests that they need to consider why tests are important. • SIL1 offers a reason for using the test. • It is strategic. It will help them with their reasoning. • Metacognitive issue relating to S2's earlier question. • SIL1 suggests ultimately they have to decide whether they need to learn the tests.	IF: Clarify C: Strategy UF: Task
	Oh. Do you understand this *Sine quo non* … but for the bad conduct there would be no harm. Do you understand?	76.1	• SIL1 brings them back to the issue of *sine qua non*. • SIL1 wants to know whether they understand it.	IF: Question C: Understand UF: DCU
	I don't want the test to confuse you. If the test is going to help you, then learn it and know it, but if it's going to confuse you and you understand causation already, then you can discard that test if you want.	76.2	• SIL1 states that they need to learn the test if they think it will help them. • SIL1 suggests strategic use of test.	IF: Comment C: Strategy UF: Task
	Do you understand what I mean?	76.3	• SIL1 asks if they understand what he means.	IF: Question C: Understand UF: Group
	It's meant to help you, these tests are meant to help you answer the question. Not to confuse you and throw you off.	76.4	• SIL1 states that the tests are meant to help, not to confuse. • SIL1 repeats earlier statements re tests.	IF: Justify C: Strategy UF: Task
	Does everybody understand causation – what we mean by XXX?	76.5	• SIL1 asks if everyone understands what is meant by causation.	IF: Question C: Repetition UF: Intersubjectivity

S6	Direct link between lethal accident as opposed to …	77	• S6 wants to demonstrate her understanding of it.	IF: Inform C: Fact UF: Contribution
S1	As opposed to refusal to take a blood transfusion after the accident.	78	• S1 relates the discussion back to his earlier example.	IF: Inform C: Fact UF: Contribution
SIL1	Does everybody understand that link in causation?	79	• SIL1 wants to know if everyone understands.	IF: Question C: Understand UF: Group
S5	Do you know what happened? As you flew out the window as a result of the accident, lying in the road, another driver drives past and drives over you. Would that give you causation?	80	• S5 presents a different scenario for consideration. • S5 asks if her example would be a case of causation. • S5 is trying to understand the limits of the concept of causation.	IF: Query C: Example UF: DCU
SIL1	Well, what do *you* think, using that …	81	• SIL1 redirects the question back to her to make her think about it herself.	IF: Invite C: UF: Engagement
S5	Ja, because I wouldn't be in the road in the first place if it wasn't for the accident.	82	• S5 thinks that there would be causation. • S5 offers a reason for her answer.	IF: Justify C: Interpretation UF: DCU
SIL1	Okay. Do you see what you've got to look at? Who caused the accident? How was the accident caused that threw you out the window? Do you understand?	83	• SIL1 wants her to think about it more as she is not right. • SIL1 asks a probing question. • SIL1 presents more questions to allow her to think about it more carefully. •	IF: Question C: Understand UF: DCU
	You're not going to look at the person driving over you.	83.1	• SIL1 wants her to think about it more as she is not right. • SIL1 asks a probing question. • SIL1 presents more questions to allow her to think about it more carefully. • SIL1 suggests what is important to consider in the scenario.	IF: Clarify C: Strategy UF: Amplify
S5	I am looking at it like the guy who actually caused my accident, so ...	84	• S5 suggests that she looks at it from the point of view of one of the actors in the scenario.	IF: Justify C: Interpretation UF: DCU
SIL1	How was the accident caused? Normal driver. Car in front of him slams on breaks, could not stop in time. You flew out the window.	85	• SIL1 restates example. • SIL1 explains the facts of the case. • SIL1 asks her what the test states.	IF: Clarify C: Example UF: DCU
	What do you think in that case? Does the test ... what does the test say ... but for the ...	85.1	• SIL1 wants her to apply the test • SIL1 want her to be clear on what the test says. •	IF: Probe C: UF: Engagement
S2	But for X's conduct, the result would not have occurred.	86	• S2 reads from the notes what the test states.	IF: Inform C: Fact UF: Contribution

SIL1	X is the driver in that case. What do you think? X is driving normally, etc.	87	• SIL1 relates the test to the case. • SIL1 asks S2 what she thinks. • SIL1 clarifies the facts of the case for S2	IF: Invite C: UF: Engagement
S2	You're saying X was the driver, he caused the accident.	88	• S2 wants to make sure of the facts.	IF: Question C: Fact UF:Intersubjectivi-ty
SIL1	The passenger flew out the window.	89	• SIL1 relates part of the story for S2.	IF: Inform C: Fact UF: Contribution
S2	There is a direct link because if X had not ...	90	• S2 gives an answer.	IF: Justify C: Interpretation UF: DCU
	How was X driving?	90.1	• S2 realises that things might be more complicated than she imagined at first. • S2 asks how X was driving.	IF: Question C: Puzzle UF: Intersubjectivity
SIL1	Ja, okay, I said X is driving normally. He is not drunk. The car in front of him slams his breaks. X can't stop in time. He smashes into the driver in front of him. In that case, is there a cause...?	91	• SIL1 restates facts.	IF: Clarify C: Repetition UF: DCU
S2	There isn't a direct link in that case.	92	• S2 now changes her mind about whether there is causation or not. • S2 now seems to understand how causation works with this example.	IF: Comment C: Interpretation UF: Contribution
SIL1	Why not?	93	• SIL1 probes for her reasoning.	IF: Probe C: Problem UF: Engagement
S2	Because wasn't?	94	•	IF: Query C: UF: Intersubjectivity
S2	... it would have been different if X had been able to stop. If it was possible for him to stop, then there would be a direct link. But the circumstances ...	94.1	• S2 presents a scenario where the causation link would pertain.	IF: Justify C: Interpretation UF: DCU
SIL1	So what ... what...?	95	• SIL1 probes S2 for deeper reasoning.	IF: Probe C: UF: Engagement
S4	It was the car in front of him XXX The car in front of his' conduct.	96	• S4 argues where the fault lies.	IF: Comment C: Interpretation UF: Contribution
S2	If the car in front of him was X, then there is a direct link.	97	• S2 makes link between accident and cause.	IF: Explain C: Interpretation UF: Contribution
SIL1	So, you see how it flows onto all the players. I just want us to make sure here.	98	• SIL1 asks whether they see how the problem works. • SIL1 says he wants to be certain	IF: Comment C: Reflection UF:

				they understand.	Intersubjectivity
	Change the fact. X has been drinking. Is there some form of causation here?	98.1	• SIL1 presents different scenario for consideration. • SIL1 asks them to consider whether there would be causation in his new example.		IF: Probe C: Problem UF: Engagement
S2	Ja.	99	• S2 answers in the affirmative.		IF: Inform C: Opinion UF: Contribution
SIL1	I just want to make sure everyone understands. Do you see how there can be a link between the driver and what happens to the passenger?	100	• SIL1 clarifies argument. • Makes sure they follow argument.		IF: Question C: Understand UF: Group
S7	You say X is driving. Is he still driving normally, even though he was drinking?	101	• S7 wants to clarify the facts of the new scenario.		IF: Question C: Example UF: Task
S2	No, he is drunk.	102	• S2 answers the query.		IF: Inform C: Fact UF: Task
SIL1	No, he is drunk. Maybe he was swerving a little bit, playing a little bit, speeding...	103	• SIL1 repeats what S2 has said. • SIL1 clarifies the facts.		IF: Clarify C: Example UF: Task
S6	And then the guy flies out the window, X smashes into someone …	104	• S6 adds to the story of the case.		IF: Inform C: Repetition UF: Task
SIL1	One of them is killed or gets his leg driven over, loses the use of his legs.	105	• SIL1 presents the conclusion of the story.		IF: Inform C: Example UF: Task
	Who's to blame? That's what we're looking at.	105.1	• SIL1 asks who would be to blame. • SIL1 states that the issue they are looking at is who is to blame.		IF: Probe C: UF: Engagement
S6	XXX	106	• S6 answers.		IF: Inform C: Fact UF: Contribution
SIL1	X is to blame. That is the link you need to find. That is the causation link.	107	• SIL1 repeats her answer. • SIL1 states that they need to find the causation link.		IF: Support C:Interpretation UF: DCU
	All causation means is ... Is there someone to blame? Is somebody at the root of the cause of it? Now if you say, "Yes, that person did cause it", or he could have caused it, then you're not to say to yourself: Has he acted in a way that it could be said that it was his fault? He did something. His action was wrong, or his action was bad, so that he caused it.	107.1	• SIL1 summarises how they need to go about thinking through the problem. • SIL1 shows how he would go about thinking through the question. • Thus SIL1 demonstrates how to apply the test for causation.		IF: Clarify C: Interpretation UF: DCU

	This is quite an intricate section. I said to you *delict* is very involved and that's why we're taking so long.	107.2	• SIL1 says the section is complicated.	IF: Comment C: Opinion UF: Task
	So it's okay if this question takes us three weeks to manipulate, to solve, to set out. But I need you guys to know every single aspect. This is what you've got to deal with in the exam. You're going to be writing these things down exactly. Like we've been doing it here. It's just going to be merely a change of the facts of the question.	107.3	• SIL1 explains the reasoning behind his modus operandus with this question • SIL1 says it's okay if it takes three weeks to work through the question. • SIL1 says he needs them to understand the detail. • SIL1 explains that this is the kind of thing they have to deal with in exams – only the facts change.	IF: Justify C: Strategy UF: Task
	So, does everybody understand causation?	107.4	• SIL1 asks if they all understand. • SIL1 sure that they are ready to move on to next task.	IF: Question C: Understand UF: Group
SS	Hmmmmm.	108	• They indicate that they all understand.	IF: Inform C: Understand UF: Task
SIL1	Okay, what's next? Can anybody tell us anything about loss?	109	• SIL1 asks what is next. • This time SIL1 does not give them a choice. • Earlier someone suggested what they still needed to do. • SIL1 asks for contributions about loss.	IF: Invite C: UF: Participation
S4	Aren't there two types?	110	• S4 has query. • S4 thinks there are two types.	IF: Query C: Puzzle UF: Contribution
SIL1	Okay, two types.	111	• SIL1 reflects what S4 thinks.	IF: Support C: Repetition UF: Task
S2	No, there are three.	112	• S2 disagrees. • S2 says there are three types.	IF: Disagree C: Fact UF: Contribution
SIL1	Okay, do you want to …S5 do you want to help us out with one or two?	113	• SIL1 asks S5 for suggestions.	IF: Invite C: UF: Participation
S5	I'm thinking. Patrimonial.	114	• S5 is not sure. • S5 says she is thinking about it. • S2 points to her file so that S5 can read about the types of loss. (*Laughter.*) • She finds an answer in the file.	IF: Inform C: Fact UF: Contribution
SIL1	Okay, it's nice peeping.	115	• SIL1 suggests that it is easy to look.	IF: Comment C: Opinion UF: Task

S5	But I don't know what it means.	116	• S5 admits that she does not understand. • This is an issue that demands more time.	IF: Request Assist. C: UF: DCU
SIL1	Okay, financial?	117	• SIL1 suggests an answer to her.	IF: Suggest C: Interpretation UF: Engagement
S3	Pecuniary.	118	• S3 picks up the thread.	IF: Inform C: Fact UF: Contribution
SIL1	Pecuniary.	119	• SIL1 repeats what S3 had said.	IF: Support C: Repetition UF: Task
S2	Loss to personality and ...	120	S2 gives another type of loss.	IF: Inform C: Fact UF: Contribution
SIL1	I just want to explain where it comes from. XXX was allowed to keep a bit of pocket money. That pocket money was called a pecuniary. I just want you to remember the kind of loss. It was a little sack of money they were allowed to keep. Peculiar. (*Laughter*)	121	• SIL1 takes the focus back to pecuniary loss. • SIL1 explains the etymology of word. • SIL1 says he want them to remember what kind of loss it is. • They have fun thinking of it as peculiar.	IF: Inform C: Fact UF: DCU
SIL1	No, no, the loss that you've got here (in your notes). The second kind of loss. You've got patrimonial, pecuniary loss.	121.1	• SIL1 tries to show a student where they are.	IF: Inform C: Fact UF: Intersubjectivity
	That's what I want you to remember.		• SIL1 says he wants them to remember pecuniary loss. • S3 looks lost.	
	So let's carry on. We've just said two types of loss. What's the third one?	121.2	• SIL1 moves group forward. • SIL1 says what they've got. • SIL1 asks what the third loss is.	IF: Question C: Puzzle UF: Participation
	Let's start with pat rimonial.	121.3	• SIL1 suggests they start with patrimonial loss.	IF: Suggest C: UF: Task
	Who wants to help us out with an explanation of that?	121.4	• Asks for explanation from group. • Imposes structure.	IF: Invite C: UF: Participation
S4	(*Takes file*) Here ... or no wait ... pecuniary ...	122	• S4 want to find an explanation in her file.	IF: Suggest C: UF: Contribution
S1	Patrimonial is loss of property.	123	• S1 explains what it is.	IF: Inform C: Fact UF: Contribution

SIL1	So what kind of loss is it?	124	• SIL1 probes for more.	IF: Probe C: Puzzle UF: Engagement
Sx	Financial.	125	• Sx answers.	IF: Inform C: Fact UF: Contribution
S1	Material, a car …	126	• S1 explains what financial implies.	IF: Explain C: Fact UF: Contribution
S4	Calculable.	127	• S4 refines it further.	IF: Elaborate C: Fact UF: Contribution
SIL1	That's what I want.	128	• SIL1 is happy with S4's answer.	IF: Inform C: Fact UF: Contribution
S4	(*Reading*). Encompasses both loss already suffered and future loss.	129	• S4 reads and explanation from her notes.	IF: Inform C: Fact UF: Contribution
SIL1	Oh, that's a nice way of putting things. But do you understand what that says?	130	• SIL1 asks whether she understands what she is reading. • SIL1 wants to be sure she knows what the notes mean.	IF: Comment C: Reflection UF: Task
S4	Yes. Calculable is pecuniary loss, money-related loss.	131	• S4 explains what the notes mean.	IF: Inform C: Fact UF: Contribution
SIL1	Okay, what's important about it? You say it's calculable. It has a definite value. That's always very important in Law. It's important to know whether something has a fixed value or something has a value that can be estimated. And in the case of a patrimonial loss, it's a value that can be fixed. You can work it out.	132	• SIL1 asks what is important about it. • SIL1 gives an elaborated explanation.	IF: Clarify C: Interpretation UF: DCU
S4	Sorry ... so the definition of pecuniary loss, falls under patrimonial loss.	133	• S4 states how she understands it. • S4 asks for clarification	IF: Question C: Concept UF: DCU
SIL1	Yes, yes. Sorry, I did not make that clear. Pecuniary fall under patrimonial loss.	134	• SIL1 apologises for not being clear. • SIL1 offers an elaborated explanation.	IF: Clarify C: Fact UF: DCU
	So, patrimonial loss is a loss of financial value. Whether it be property or anything. But the second part of that is, it also as you said, works for the future.	134.1		IF: Elaborate C: Fact UF: DCU
	Can you give an example?	134.2	• SIL1 requests an example to illustrate his explanation.	IF: Invite C: Puzzle UF: Participation

SIL1	Okay, so does everybody understand that, what it is?	134.3	• SIL1 asks if everyone understands.	IF: Question C: Understand UF: Group
	It's for the value of your arms now, your hands or whatever. You probably won't get anything for the now-value, but you are going to get something for the future value.	134.4	• SIL1 offers further explanation.	IF: Explain C: Interpretation UF: DCU
S1	But I don't know how to work that out because it's damage to a person's arm.	135	• S1 is confused. • S1 does not understand how bodily harm can be calculated. (Two conversations happening at the same time.)	IF: Request Assist C: Problem UF: DCU
S4	Or what if somebody were a famous artist and he made a painting and somebody deliberately tear it up or something. There is a market art value, he could have made like a million or something.	136	• S4 offers an alternative example.	IF: Suggest C: Example UF: DCU
S1	Or a good example ...	137	• S1 thinks of an example that may explain his earlier question.	IF: Suggest C: Example UF: Contribution
S2	I think a good example applies to pain and suffering.	138	• S2 suggests that an example relates to pain and suffering.	IF: Comment C: Reflection UF: DCU
SIL1	It can fall under both XXX.	139	• SIL1 clarifies categorisation.	IF: Inform C: Fact UF: DCU
S1	Like in commerce. If people damage goods in transit, then they have to be sold at a loss.	140	• S1 completes his earlier "good example".	IF: Suggest C: Example UF: DCU
SIL1	It's commonly got to do with ... You're right in one way, but you're wrong. You see, pain and suffering has a little more to do with the emotional/mental aspect than the physical aspect. When you look at the law, these are objects (points to his arm). I mean you can insure your arms, you can insure your legs.	141	• SIL1 goes back to S2's earlier query relating to the categorisation of the example. • SIL1 explains how complicated the issue is. •	IF: Clarify C: Fact UF: DCU
S2	Then how come you have the XXX remedy for pain and suffering related, to do with bodily injury?	142	• S2 questions why there is a connection between remedy and bodily harm.	IF: Query C: Puzzle UF: DCU
SIL1	Ja. It's the same kind of thing. You can put it under both.	143	• SIL1 agrees with her categorisation.	IF: Inform C: Fact UF: Contribution
S2	Okay.	144	• S2 seems happy with the explanation.	IF: Inform C: Understand UF: Task
SIL1	I don't want you to be confused about it.	145	• SIL1 states that he does not want the group to be confused.	IF: Comment C: UF: Group

	It can go under both remedies.	145.1	• SIL1 repeats that both remedies are applicable. •	IF: Clarify C: Repetition UF: DCU
S1	What would you recommend? (*General laughter*)	146	• S1 asks SIL1 which remedy he would recommend. • Group finds that funny.	IF: Question C: Strategy UF: Light relief
S2	I think you should ask Prof. that.	147	• S2 mocks the SIL1 - relates to previous answer by SIL1 to similar questions.	IF: Suggest C: Opinion UF: Light relief
S4	I just want to read you what it says here under definition of patrimonial loss. It says: "It is calculated by determining the difference between the value of the plaintiff's estate after the commission of delict and the value it would have had if delict had not been committed."	148	• S4 shares the explanation in the notes. • S4 is still busy with calculable loss. • Thus S4 clarifies what the SIL1 has been trying to explain above.	IF: Inform C: Fact UF: Contribution
	And it also says (different set of notes): "To calculate an amount in cases of personal injuries which loss usually takes the form of medical expenses and loss of future earnings. This normally takes the form of an annuity. Plaintiff receives amount which enables him to receive a payment of which makes up for loss of his earnings."	148.1		IF: Inform C: Fact UF: Contribution
SIL1	That fell under?	149	• SIL1 asks her for clarification of categories.	IF: Question C: Puzzle UF: DCU
S2	That was both under patrimonial loss.	150	• S2 answers SIL1's question.	IF: Inform C: Fact UF: Contribution
S1	Hmmmmmmm.	151	• That seems to clarify something for S1.	IF: Inform C: Understand UF: Task
SIL1	XXX Definition and an example - it can sort things out like that (clicks fingers). I promise you. You don't even have to ask Prof. (*Laughter*)	152	• SIL1 explains that if he knows a definition and an example, they have what it takes to answer problems. • Fun	IF: Inform C: Strategy UF: Task
SIL1	Okay, firstly, do you understand how the property works?	152.1	• SIL1 is moving on. • SIL1 asks if they understand how property works.	IF: Question C: Understand UF: Task
	You take a person's estate, you take everything that he's worth now. And then you say, okay, lets take what it would be worth if you paid that thing off, if you didn't have that thing Oh, so do you understand?	152.2	• SIL1 explains how it works. • SIL1 then asks if they understand his explanation.	IF: Explain C: Concept UF: DCU

	It's that difference. The material value. That difference in the amount of money or loss you suffered. That' how you work it out. And then patrimonial works in the same way, but to do with medical expenses and everything.	152.3	•	SIL1 clarifies what he means.	IF: Clarify C: Concept UF: DCU
	But, look it up for a more clear and precise definition to write that down for you to study and learn.	152.4	•	SIL1 suggests they research further for clarity.	IF: Suggest C: Strategy UF: Task
	I don't suppose you've got a chapter reference?	152.5	•	SIL1 asks for reference from S4 for benefit of group.	IF: Request C: UF: Task
S1	What's that XXX principles?	153	•	S1 asks for clarification of content referred to by S4.	IF: Question C: Puzzle UF: Task
S4	Ja, p. 657.	154	•	S4 gives page number SIL1 asked for.	IF: Inform C: Fact UF: Task
SIL1	Moving on. What's next?	155	•	SIL1 want s to move on.	IF: Question C: UF: Direction
	Sorry, did everyone understand patrimonial loss?	155.1	•	Asks if everyone understands.	IF: Question C: Understand UF: Task
	Okay, what's next?	155.2	•	Asks them for the next step.	IF: Question C: Repetition UF: Direction
S1	Pain and suffering.	156	•	S1 suggests pain and suffering.	IF: Inform C: Fact UF: Contribution
SIL1	Okay, does anybody want to help us out with some pain and suffering?	157	•	SIL1 asks if anyone in the group would like to help.	IF: Invite C: UF: Participation
S5	Basically, if you were to lose your arm. Well, you know, Prof. gave us the example of where you still have pain and feeling in your arm six months after.	158	•	S5 recalls an example from class, given by the lecturer.	IF: Inform C: Class memory UF: Contribution
S2	Phantom pain.	159	•	S2 gives correct term for the condition referred to in S5's example.	IF: Inform C: Fact UF: Contribution
S5	Yes. Which could be your pain and also to live without an arm - emotionally.	160	• •	S5 acknowledges S2's help with terminology. S5 explains that her example could relate to pain and suffering.	IF: Comment C: Interpretation UF: Contribution
SIL1	I'll give you a very good example of pain and suffering. A Third Party claim.	161	• •	SIL1 offers another example. SIL1 brings in 3rd Party.	IF: Suggest C: Example UF: DCU
	Does everybody know what a third party is? You have a motor vehicle accident.	161.1	•	SIL1 asks whether they know about 3rd Party before he explains.	IF: Question C: Puzzle UF: DCU

S4	Oh, is it when you have, they sue for damages and the …	162	• S4 attempts to explain about 3rd Party.	IF: Suggest C: Interpretation UF: Contribution
	No, I think that's compensation. They sue for damages. Let's say X sues Y for damages but in the meantime, X's insurance company pays out the amount to cover the damages. But, because of his pain and suff … So, he's actually covered for all actual expenses of medical bills and stuff. But the actual loss, future loss and that sort of stuff. That's where he get from …	162.1	• But, suggests herself that she might be talking about something else – compensation. • S4 gives an example of compensation.	IF: Elaborate C: Example UF: DCU
SIL1	That's what he's going to get, ja.	163	• SIL1 agrees with her argument relates to compensation.	IF: Support C: UF: Task
	But in the case of motor vehicle accident, you get it from the Third Party. It's a fund set up by Government. Every time you fill up petrol, a cent, two cents may …	163.1	• SIL1 returns to his original explanation of 3rd Party Fund. • SIL1 explains where money for 3rd Party Fund comes from. •	IF: Inform C: Fact UF: Contribution
	The reason I explain this to you, is you may get it as a question. You've got to understand the context. So, every time you fill up with petrol, every litre, three, four, five cents go into the Third Party fund. And you can sue them for things like pain and suffering, which will include if you have to go to a psychiatrist or you have to see a, ja, a psychiatrist for example. For you to go on some medication for your pain and suffering. So, its aimed at pain and suffering.	163.2	• SIL1 explains why he is spending time on it the issue of 3rd Party • SIL1 says they have to understand the context. • SIL1 explains what can be sued for under 3rd Party claims.	IF: Justify C: Strategy UF: Task
	Let me give you an example and see if you understand it. Say your mother passes away and you are five. She has a violent death. She dies in a car accident.	163.3	• SIL1 sets a problem to assess their understanding. • SIL1 gives an example.	IF: Suggest C: Example UF: DCU
	Can you sue for pain and suffering?	163.4	• SIL1 asks if one can sue for pain and suffering.	IF: Question C: Problem UF: DCU
S5	Ja. Your dad can sue. Obviously, you can't sue at five.	164	• S5 answers; qualifies her answer.	IF: Inform C: Fact UF: Contribution
SIL1	Okay. When it comes to pain and suffering there is ... What was the last thing Prof. told us about pain and suffering? Can anybody remember what that is?	165	• SIL1 asks them to think back to what the Prof. said in class about pain and suffering.	IF: Question C: Puzzle UF: Task
	It's not only physical pain; it's also loss of amenities.	165.1	• SIL1 suggests an answer.	IF: Inform C: Fact UF: Contribution

SS	Amenities?	166	• Students do not understand what he means.	IF: Question C: Puzzle UF: Task
S2	Amenities ... but I don't think it's appropriate.	167	• S2 does not agree with the suggestion that one can sue for loss of amenity.	IF: Disagree C: Opinion UF: Contribution
S4	Can ... is anything about ... I don't know ... because the child's only five XXX.	168	• S4 grapples with problem. • S4 struggles to formulate what her query is.	IF: Question C: Problem UF: DCU
SIL1	No, it's not that. If you look at your notes. You can't sue for somebody else's pain and suffering. What I am telling you is that the child can't sue in this case.	169	• SIL1 explains that they will find the answer in their books. • SIL1 gives them the answer and explanation. • This all relates to S5's answer that the father can sue on behalf of the five-year-old child.	IF: Inform C: Fact UF: DCU
SIL1	There are other remedies to sue for, but not under this heading. You can sue for loss of income or loss of money, but you can't sue for ... Just because you feel pain and because you feel upset emotionally, you cannot sue the other person for pain and suffering.	169.1	• SIL1 explains the complication around this problem. • SIL1 explains what can be sued for and what not.	IF: Clarify C: Fact UF: Contribution
S5	That's so stupid. A mom dies … a family of kids …	170	• S5 thinks that the loss of a mother is a valid case of pain and suffering.	IF: Comment C: Opinion UF: Task
SIL1	If the mother is the sole source of income, you can sue for income. But you can't sue for pain and suffering.	171	• SIL1 explains under what circumstances the death of a mother can lead to a claim.	IF: Explain C: Fact UF: DCU
	How can you measure it? It is very difficult ... how much of it is related to that incident.	171.1	• SIL1 asks how one can measure pain and suffering. • Rhetorical question.	IF: Comment C: Reflection UF: DCU
S7	You usually, if you're a mother and you see your child run across the street. He is run over, you see your child getting run over. Would you receive … would you …?	172	• S7 asks question related to issue of pain and suffering. • Offers a scenario, asks questions about it.	IF: Question C: Problem UF: DCU
S2	He did say something. You also mentioned the one about someone having psycho ... you have a (points at her head) ... A mental breakdown. He said you could get money for that.	173	• S2 remembers what the professor said about it. • S2 remembers that it had something to do with psychological pain but when her words fail, she uses gesture. • S2 remembers the term she is looking for. • States that Prof said one could claim for that.	IF: Inform C: Class memory UF: DCU
SIL1	Did he say anything about causation? Did he say there was a link?	174	• SIL1 brings the discussion back to causation. • SIL1 focuses discussion.	IF: Question C: Puzzle UF: DCU

S5	That's a separate thing.	175	• S5 disagrees. • S5 suggests that what S2 recalls is not related.	IF: Disagree C: Opinion UF: Task
SIL1	It's a separate thing. What I'm saying is it's not the same kind of thing.	176	• SIL1 agrees with S5.	IF: Support C: Repetition UF: DCU
	I don't want you to get confused about it. I'll look it up.	176.1	• SIL1 says he does not want to confuse them. • SIL1 wants to leave it there and look it up.	IF: Inform C: Reflection UF: Group
S5	What he said was: There must be a casual link between what happens and the person and not between the person and someone else.	177	• S5 recall what the prof. had said. • Relates to S2 and the SIL1's dilemma.	IF: Inform C: Class memory UF: DCU
SIL1	Ja, that's what I'm saying.	178	• SIL1 agrees with her explanation.	IF: Support C: Reflection UF: Task
S5	You can't have it with a double (?) link.	179	• S5 clarifies further.	IF: Inform C: Fact UF: DCU
SIL1	That's correct. Okay.	180	• SIL1 says S5 is correct.	IF: Support C: UF: Task
	What's our third loss?	180.1	• SIL1 moves on. • Asks what third loss is.	IF: Question C: Puzzle UF: Participation
S2	Personality interest.	181	• S2 suggests the next loss.	IF: Inform C: Fact UF: Contribution
SIL1	Who wants to offer something about personality interest?	182	• SIL1 asks for contributions about the concept from the group.	IF: Invite C: UF: Participation
S5	Defamation. (*General laughter*)	183	• S5 offers contribution • Group finds that funny. Laughs.	IF: Inform C: Fact UF: Contribution
S2	Do you want an example?	184	• S2 asks whether SIL1 wants an example.	IF: Question C: UF: Task
SIL1	S2, you are the stupidest, waste-of-time journalist I have ever met in my life. (*General laughter*)	185	• SIL1 makes a "joke" at S2s expense to demonstrate defamation. • Group laughs.	IF: Clarify C: Example UF: DCU
	Anyone who has read this question. The latter part of the question deals with a certain type of defamation.	185.1	• SIL1 refers them back to the original question they are working on. • The latter part of the question deals with a specific type of defamation.	IF: Inform C: Fact UF: Task

S2	But you know why. You're the one who's being dumb now. You have to distinguish. There's one where they say ... there are two types. There can either be an injury to your personality, but they say it to you. Not emphasising it. But I'm telling you certain people may have thought it was, Mike.	186	• S2 draws his attention to the fact that there are different types of defamation. • S2 suggests that they should be clear about exactly what constitutes defamation. • S2 explains the different situations in which defamation can happen.	IF: Elaborate C: Interpretation UF: DCU
SIL1	Okay. In order for it to be defamation, there has to be one other party.	187	• SIL1 agrees with her. • SIL1 summarises her point.	IF: Inform C: Fact UF: DCU
S5	Publication.	188	• S5 adds another possibility for defamation to be present.	IF: Inform C: Fact UF: Contribution
SIL1	But at the same time it must not be so outrageous that you can't believe it.	189	• SIL1 suggests the limits of defamatory action.	IF: Inform C: Fact UF: DCU
	And a case of what was ... There's an American case which is Larry Flint, it's... (*General laughter*.)	189.1	• SIL1 presents an example of non-defamation. • Group finds it funny. Laughter.	IF: Elaborate C: Example UF: DCU
S4	They said he had sex with his mother. He publicised that this priest had sex with his mother, you know, his own mother. And they found it was so outrageous that a decent human being would not have believed it.	190	• S4 elaborates on the story of the example presented by the SIL1. • S4 gives more details.	IF: Elaborate C: Example UF: DCU
S3	It was an advert for a drink or something that said this priest had slept with his mother and....	191	• S3 adds to the story.	IF: Inform C: Fact UF: Contribution
S5	He slept with his own mother .... oh. (*Laughter*)	192	• S5 registers mild outrage at the suggestion of incest in the story.	IF: Clarify C: Fact UF: Intersubjectivity
SIL1	Remember that as an example of what I'm talking about. Defamation, okay. For there to be defamation, I must say it in front of somebody and it can't be so outrageous.	193	• SIL1 suggests to S2 that the example could be remembered for future reference • SIL1 summarises limitations to defamation.	IF: Clarify C: Repetition UF: Amplify
S2	And it must change what others think of you.	194	• S2 draws attention to another important pre-condition for defamation.	IF: Inform C: Fact UF: Contribution
SIL1	... think of you. It's got to be in such a way that when I look at you again I'll think, actually you are a bit of a slut. You know what I mean, that kind of thing. If it changes other people's viewpoint of you then there is defamation.	195	• SIL1 repeats her point. • SIL1 offers an example of what S2 has said.	IF: Elaborate C: Interpretation UF: DCU

S7	Sorry, you say it has to be in front of you?	196	• S7 asks a question to clarify the conditions under which something is defamation.	IF: Question C: Puzzle UF: DCU
SIL1	No, not in front of you, other people.	197	• SIL1 answers S7's query.	IF: Inform C: Fact UF: DCU
S4	There ... it's got to be witnessed.	198	• S4 further clarifies for S7.	IF: Clarify C: Repetition UF: DCU
S2	No (gesticulates).	199	• S2 seems to disagree.	IF: Disagree C: UF: Task
SIL1	It's got to change somebody's viewpoint of you and it must be ...	200	• SIL1 states the point S2 made earlier about defamation.	IF: Clarify C: Repetition UF: DCU
S2	For instance, the tut we just did. That was not defamation. Why? Because it has to be said in front of other people. It wasn't publicised and this one is publicised.	201	• S2 elaborates. • S2 relates it back to another example that was discussed in an earlier tutorial. • Explains why the tutorial case was not defamation.	IF: Clarify C: Example UF: Contribution
S5	It wasn't defamation.	202	• S5 repeats that it was not defamation.	IF: Support C: Repetition UF: Contribution
S2	But the woman wasn't charged with defamation	203	• The group discuss the example. They clarify why the tutorial case was not one of defamation.	IF: Inform C: Fact UF: Contribution
S5	Ja, but only because he was her spiritual adviser.	204		IF: Inform C: Fact UF: Contribution
	No, but another thing they said ...	204.1		IF: Suggest C: UF: Contribution
S2	It would have been defamation if the woman had gone and publicised to the neighbours and the thingies and the thingies. But she didn't. It would have been defamation. She told this one guy.	205		IF: Explain C: Interpretation UF: Contribution
SS	Ja.	206		IF: Support C: UF: Task
S7	She told this one guy. She told this priest whom she had confided in and she also had a history of regular confession with the priest.	207		IF: Support C: Repetition UF: Contribution
S2	Yes. And what I'm telling you is the Law says it wasn't defamation because of that.	208	Epistemological issue.	IF: Clarify C: Fact UF: Contribution
SIL1	So, does everybody understand where we've gone through this case? Is everybody happy?	209		IF: Question C: Understand UF: Group

S2	What's the answer?	210	• Joke?	IF: Question C: UF: Light relief
SIL1	What's the answer? We have not got near the answer, yet. We will get to the answer.	211	• SIL1 states again that it is a process.	IF: Inform C: Reflection UF: Task

No	Participant	IF	Content	UF	
1	SIL	Invite		Task	**Stage 1:** SIL1 brings the session to order and initiates the work by creating intersubjectivity. He ensures that everyone is clear about the progress reached on the task during the previous session.
1.1	SIL	Invite		Participation	
1.2	SIL	Invite		Participation	
2	S1	Inform	Fact	Contribution	
3	SIL	Question	Understand	Inter-subjectivity	
3.1	SIL	Question	Repetition	Inter-subjectivity	
3.2	SIL	Support	Repetition	Inter-subjectivity	
3.3	SIL	Question		Direction	**Stage 2:** SIL1 negotiates sub-task 1. SIL1 negotiates individual participation with group.
4	S2	Inform	Fact	Contribution	
5	SIL	Support	Repetition	Inter-subjectivity	
5.1	SIL	Invite		Participation	
6	S3	Question		Inter-subjectivity	**Stage 3:** S3 initiates sub-task 1.
7	S4	Inform	Fact	Contribution	
8	S3	Elaborate	Fact	Contribution	
9	SIL	Request		Participation	
10	S3	Explain	Fact	Contribution	
11	S1	Disagree		Contribution	**Stage 4:** S1 initiates cognitive controversy that is resolved through contributions by S4, S3, S2 and SIL1.
12	S4	Support		Task	
13	S1	Inform	Fact	Contribution	
14	S2	Support		Task	
15	SIL	Clarify	Fact	DCU	
15.1	SIL	Comment	Opinion	Group	
15.2	SIL	Question	Understand	Inter-subjectivity	**Stage 5:** Re-establishment of intersubjectivity after the resolution of the controversy.
15.3	SIL	Comment	Reflection	Inter-subjectivity	
16	S5	Question	Strategy	Direction	
17	SIL	Comment	Opinion	Task	
18	S3	Comment	Reflection	Task	
19	SIL	Support	Reflection	Amplify	
19.1	SIL	Comment	Strategy	Task	
19.2	SIL	Comment	Reflection	Task	
19.3	SIL	Inform	Strategy	Task	
19.4	SIL	Question		Task	
20	S2	Inform	Strategy	Contribution	
21	SIL	Probe	Puzzle	Participation	
22	S3	Inform	Interpretation	Contribution	
23	SIL	Probe		Engagement	
24	S5	Suggest	Reflection	Contribution	
24.1	S5	Question		Contribution	**Stage 6:** S5 initiates sub-task 2 through question about the appropriate strategy to deal with content area in an examination.
25	S4	Request		Individual needs	
26	S2	Suggest	Example	Contribution	
27	SIL	Inform	Example	Contribution	
28	S2	Disagree	Reflection	Task	

29	SIL	Support		Task	**Stage 7:** S2 initiates sub-task 3 through disagreeing with the categorisation of a legal problem. This is followed by a request to expand on a point made earlier by S3.
30	S2	Question		Direction	
31	S3	Inform	Fact	Group	
32	S2	Comment	Reflection	Inter-subjectivity	
32.1	S2	Inform	Reflection	Task	
33	SIL	Question	Puzzle	Task	
34	S4	Inform	Fact	Contribution	
35	SIL	Probe	Puzzle	Task	
36	S4	Inform	Fact	Contribution	
37	S2	Inform	Fact	Contribution	
38	SIL	Support	Repetition	Task	
39	S3	Comment	Opinion	Contribution	
40	S2	Comment	Opinion	Contribution	
41	SIL	Support	Repetition	Task	
41.1	SIL	Question		Inter-subjectivity	
42	S4	Inform	Fact	Contribution	
43	S2	Elaborate	Fact	Contribution	
44	S3	Inform	Fact	Contribution	
45	S5	Inform	Fact	Contribution	
46	SIL	Question	Puzzle	DCU	
47	S7	Inform	Example	Contribution	
48	SIL	Support		Task	
49	S1	Elaborate	Fact	Contribution	
50	S2	Inform	Class memory	Contribution	
51	S6	Support	Class memory	Contribution	
52	S5	Support	Repetition	Task	
53	S2	Comment	Opinion	Group	
54	SIL	Question	Understand	Task	**Stage 8:** SIL1 negotiates sub-task 4. The task is established. SIL1 inquires whether the concept under discussion is understood. Understanding of concept clarified.
54.1	SIL	Suggest		Task	
55	S3	Comment	Fact	Direction	
55.1	S3	Inform	Class memory	Contribution	
56	SIL	Question		Task	
57	S2	Suggest		Contribution	
58	S3	Elaborate	Fact	Contribution	
59	SIL	Question	Understand	Task	
60	S3	Inform	Fact	Task	
61	SIL	Question		Participation	
62	S5	Inform	Reflection	Task	
63	SIL	Invite		Participation	
63.1	SIL	Request	Puzzle	Engagement	
64	S5	Inform	Fact	Task	
65	SIL	Request		Participation	
66	S6	Inform	Example	Contribution	
67	S1	Elaborate	Class memory	Contribution	
68	S2	Inform	Fact	Contribution	
68.1	S2	Comment	Interpretation	Task	

246

#	Speaker	Move	Category	Type	Stage
68.2	S2	Question	Strategy	Task	**Stage 9:** S2 initiates sub-task 5. She wants to clarify an epistemic issue. Her problem is resolved.
69	SIL	Question	Puzzle	Task	
70	S2	Inform	Fact	Contribution	
71	SIL	Question	Puzzle	Task	
72	S3	Inform	Fact	Contribution	
73	S2	Inform	Fact	Contribution	
74	SIL	Support	Repetition	Task	
75	S3	Explain	Concept	Contribution	
76	SIL	Clarify	Strategy	Task	
76.1	SIL	Question	Understand	DCU	
76.2	SIL	Comment	Strategy	Task	
76.3	SIL	Question	Understand	Group	
76.4	SIL	Justify	Strategy	Task	**Stage 10:** Re-establishment of interubjectivity after sub-task 5.
76.5	SIL	Question	Repetition	Inter-subjectivity	
77	S6	Inform	Fact	Contribution	
78	S1	Inform	Fact	Contribution	
79	SIL	Question	Understand	Group	
80	S5	Query	Example	DCU	**Stage 11:** S5 initiates a return to sub-task 4. Discussion centres around several examples to clarify the ideas and concepts which are the subject of sub-task 4.
81	SIL	Invite		Enagagement	
82	S5	Justify	Interpretation	DCU	
83	SIL	Question	Understand	DCU	
83.1	SIL	Clarify	Strategy	Amplify	
84	S5	Justify	Interpretation	DCU	
85	SIL	Clarify	Example	DCU	
85.1	SIL	Probe		Engagement	
86	S2	Inform	Fact	Contribution	
87	SIL	Invite		Engagement	
88	S2	Question	Fact	Inter-subjectivity	
89	SIL	Inform	Fact	Contribution	
90	S2	Justify	Interpretation	DCU	
90.1	S2	Question	Puzzle	Inter-subjectivity	
91	SIL	Clarify	Repetition	DCU	
92	S2	Comment	Interpretation	Contribution	
93	SIL	Probe	Problem	Engagement	
94	S2	Query		Inter-subjectivity	
94.1	S2	Justify	Interpretation	DCU	
95	SIL	Probe		Engagement	
96	S4	Comment	Interpretation	Contribution	
97	S2	Explain	Interpretation	Contribution	
98	SIL	Comment	Reflection	Inter-subjectivity	
98.1	SIL	Probe	Problem	Engagement	
99	S2	Inform	Opinion	Contribution	
100	SIL	Question	Understand	Group	
101	S7	Question	Example	Task	
102	S2	Inform	Fact	Task	
103	SIL	Clarify	Example	Task	
104	S6	Inform	Repetition	Task	
105	SIL	Inform	Example	Task	
105.1	SIL	Probe		Engagement	
106	S6	Inform	Fact	Contribution	
107	SIL	Support	Interpretation	DCU	
107.1	SIL	Clarify	Interpretation	DCU	
107.2	SIL	Comment	Opinion	Task	

107.3	SIL	Justify	Strategy	Task
107.4	SIL	Question	Understand	Group
108	SS	Inform	Understand	Task
109	SIL	Invite		Participation
110	S4	Query	Puzzle	Contribution
111	SIL	Support	Repetition	Task
112	S2	Disagree	Fact	Contribution
113	SIL	Invite		Participation
114	S5	Inform	Fact	Contribution
115	SIL	Comment	Opinion	Task
116	S5	Request Assistance		DCU
117	SIL	Suggest	Interpretation	Engagement
118	S3	Inform	Fact	Contribution
119	SIL	Support	Repetition	Task
120	S2	Inform	Fact	Contribution
121	SIL	Inform	Fact	DCU
121.1	SIL	Inform	Fact	Inter-subjectivity
121.2	SIL	Question	Puzzle	Participation
121.3	SIL	Suggest		Task
121.4	SIL	Invite		Participation
122	S4	Suggest		Contribution
123	S1	Inform	Fact	Contribution
124	SIL	Probe	Puzzle	Engagement
125	Sx	Inform	Fact	Contribution
126	S1	Explain	Fact	Contribution
127	S4	Elaborate	Fact	Contribution
128	SIL	Inform	Fact	Contribution
129	S4	Inform	Fact	Contribution
130	SIL	Comment	Reflection	Task
131	S4	Inform	Fact	Contribution
132	SIL	Clarify	Interpretation	DCU
133	S4	Question	Concept	DCU
134	SIL	Clarify	Fact	DCU
134.1	SIL	Elaborate	Fact	DCU
134.2	SIL	Invite	Puzzle	Engagement
134.3	SIL	Question	Understand	Group
134.4	SIL	Explain	Interpretation	DCU
135	S1	Request Assistance	Problem	DCU
136	S4	Suggest	Example	DCU
137	S1	Suggest	Example	Contribution
138	S2	Comment	Reflection	DCU
139	SIL	Inform	Fact	DCU
140	S1	Suggest	Example	DCU
141	SIL	Clarify	Fact	DCU
142	S2	Query	Puzzle	DCU
143	SIL	Inform	Fact	Contribution
144	S2	Inform	Understand	Task
145	SIL	Comment		Group
145.1	SIL	Clarify	Repetition	DCU
146	S1	Question	Strategy	Light Relief
147	S2	Suggest	Opinion	Light Relief
148	S4	Inform	Fact	Contribution
148.1	S4	Inform	Fact	Contribution
149	SIL	Question	Puzzle	DCU

Stage 12: SIL 1 initiates sub-task 6. They discuss different types of loss and the conditions under which remedies can by applied for.

248

150	S2	Inform	Fact	Contribution
151	S1	Inform	Understand	Task
152	SIL	Inform	Strategy	Task
152.1	SIL	Question	Understand	Task
152.2	SIL	Explain	Concept	DCU
152.3	SIL	Clarify	Concept	DCU
152.4	SIL	Suggest	Strategy	Task
152.5	SIL	Request		Task
153	S1	Question	Puzzle	Task
154	S4	Inform	Fact	Task
155	SIL	Question		Direction
155.1	SIL	Question	Understand	Task
155.2	SIL	Question	Repetition	Direction
156	S1	Inform	Fact	Contribution
157	SIL	Invite		Participation
158	S5	Inform	Class memory	Contribution
159	S2	Inform	Fact	Contribution
160	S5	Comment	Interpretation	Contribution
161	SIL	Suggest	Example	DCU
161.1	SIL	Question	Puzzle	DCU
162	S4	Suggest	Interpretation	Contribution
162.1	S4	Elaborate	Example	DCU
163	SIL	Support		Task
163.1	SIL	Inform	Fact	Contribution
163.2	SIL	Justify	Strategy	Task
163.3	SIL	Suggest	Example	DCU
163.4	SIL	Question	Problem	DCU
164	S5	Inform	Fact	Contribution
165	SIL	Question	Puzzle	Task
165.1	SIL	Inform	Fact	Contribution
166	SS	Question	Puzzle	Task
167	S2	Disagree	Opinion	Contribution
168	S4	Question	Problem	DCU
169	SIL	Inform	Fact	DCU
169.1	SIL	Clarify	Fact	Contribution
170	S5	Comment	Opinion	Task
171	SIL	Explain	Fact	DCU
171.1	SIL	Comment	Reflection	DCU
172	S7	Question	Problem	DCU
173	S2	Inform	Class Memory	DCU
174	SIL	Question	Puzzle	DCU
175	S5	Disagree	Opinion	Task
176	SIL	Support	Repetition	DCU
176.1	SIL	Inform	Reflection	Group
177	S5	Inform	Class memory	DCU
178	SIL	Support	Reflection	Task
179	S5	Inform	Fact	DCU
180	SIL	Support		Task
180.1	SIL	Question	Puzzle	Participation
181	S2	Inform	Fact	Contribution
182	SIL	Invite		Participation
183	S5	Inform	Fact	Contribution
184	S2	Question		Task
185	SIL	Clarify	Example	DCU

Stage 13: The first part of sub-task 6 is concluded.

Stage 14: SIL 1 introduces the second part of sub-task 6. More types of loss are discussed. Several examples of the different concepts are given in order to clarify the concepts.

185.1	SIL	Inform	Fact	Task
186	S2	Elaborate	Interpretation	DCU
187	SIL	Inform	Fact	DCU
188	S5	Inform	Fact	Contribution
189	SIL	Inform	Fact	DCU
189.1	SIL	Elaborate	Example	DCU
190	S4	Elaborate	Example	DCU
191	S3	Inform	Fact	Contribution
192	S5	Clarify	Fact	Inter-subjectivity
193	SIL	Clarify	Repetition	Amplify
194	S2	Inform	Fact	Contribution
195	SIL	Elaborate	Interpretation	DCU
196	S7	Question	Puzzle	DCU
197	SIL	Inform	Fact	DCU
198	S4	Clarify	Repetition	DCU
199	S2	Disagree		Task
200	SIL	Clarify	Repetition	DCU
201	S2	Clarify	Example	Contribution
202	S5	Support	Repetition	Contribution
203	S2	Inform	Fact	Contribution
204	S5	Inform	Fact	Contribution
204.1	S5	Suggest		Contribution
205	S2	Explain	Interpretation	Contribution
206	SS	Support		Task
207	S7	Support	Repetition	Contribution
208	S2	Clarify	Fact	Contribution
209	SIL	Question	Understand	Group
210	S2	Question		Light Relief
211	SIL	Inform	Reflection	Task

Stage 15: SIL draws session to a close.

250

Appendix D

Marzano's nonroutine academic tasks

Decision-making tasks: Selecting among equally appealing alternatives.
The process involves:
- identifying the alternatives to be considered
- identifying the criteria used to assess the alternatives and their relative importance
- identifying the extent to which each alternative possesses each criterion
- making a selection of alternatives.

Naturalistic inquiry tasks: Developing an explanation for some past event or a scenario for some future event and then supporting the explanation or scenario.
The process involves:
- generating an initial inquiry question to be answered and the significance of the question
- identifying the criteria or standards with which to evaluate the final product
- identifying and using primary and secondary sources
- drawing a conclusion from the information gathered and articulating the relationships between the information and the conclusion
- identifying the extent to which the final explanation/scenario met the stated criteria/standards.

Problem-solving tasks: Developing, testing, and evaluating a method or product for overcoming an obstacle or a constraint.
The process involves:
- identifying the important factors affecting the problem situation along with the characteristics of the desired outcome and the constraints or obstacles in the way of achieving the desired outcome
- identifying the standards or criteria for a successful solution
- identifying the possible alternative ways of overcoming the obstacle or the constraint
- selecting and trying out an alternative
- identifying the extent to which the selected alternative produces a solution that meets the stated standards/criteria
- if other alternatives were tried, articulating the reasoning behind the order of their selection and the extent to which each met the stated standards/criteria

Scientific inquiry tasks: Generating, testing and evaluating the effectiveness of the hypotheses generated to explain a physical or psychological phenomenon and then using those hypotheses to predict future events. The process involves:
- explaining a phenomenon initially observed
- identifying the facts or principles behind the explanation
- making a prediction based on the facts and principles underlying the explanation
- setting up and carrying out an activity or experiment to test the prediction
- evaluating the results of the activity/experiment in terms of facts and principles that have been articulated
- making another prediction of future events based on the combined information from the original explanation and results of the activity.

Composing tasks: Developing a unique product or process that fulfills some articulated need.
The invention process involves:
- identifying a situation to improve on an unmet need
- identifying a purpose for the invention
- identifying specific standards or criteria the invention will meet
- developing a rough model, sketch or outline of the product
- developing the product
- continually revising and polishing the product until it reaches a level of completeness consistent with the criteria/standards that were articulated

Marzano, R. (1991). Fostering thinking across the curriculum through knowledge restructuring. *Journal of Reading 34*:7 (p. 518).

Appendix E

Table 21: Total number of forms of elements related to different aspects of mediation contributed by session participants.

Session partictipants	Process management	Cognitive engagement	First level cognition	Total
SIL1	199	125	55	379
Students	95	106	231	407
SIL2	171	173	38	382
Students	42	69	155	266
SIL3	281	76	106	463
Students	28	27	154	209