

LEARNING RELATIONSHIPS IN ONLINE CONTEXTS:
A SUBSTANTIVE THEORY CONSTRUCTED FROM THE INTEGRATED
ANALYSES OF LEARNER-LEARNER INTERACTION AND
KNOWLEDGE CONSTRUCTION IN AN UNDERGRADUATE
COMMUNICATION COURSE

A Dissertation submitted by
Dolene M. Rossi, MSc International Health (with distinction),
PGCE (Higher & Further Ed.), L/PE, DN, RM, RGN

In fulfilment of the requirements for the award of

Doctor of Philosophy
Faculty of Education, University of Southern Queensland

JANUARY
2010

Abstract

This study examines the processes of, and the relationship between, learner-learner interaction and knowledge construction in online learning contexts within a single cohort of undergraduate students. The research strategy was a single case study with an embedded case design. Social network analysis (SNA) and constant comparative method, which incorporated the analytical procedures of constructivist grounded theory, were utilised to analyse the data. The analyses revealed how learners interacted and constructed knowledge within large and small groups using asynchronous and synchronous communication, how individual learners conceptualised interaction and knowledge construction in an online communication course and how learner perceptions shaped communication and learning. A substantive theory explaining the conditions, actions, interactions and consequences of learning relationships in online contexts was constructed and the research was acknowledged retrospectively as a grounded theory study.

In this case, contextual conditions and learner perceptions shaped learning relationships. Participation in collaborative activities was characteristic of the course design yet the nature of that participation was self-determined and influenced by contextual conditions. Learners interacted with content and other learners to meet learning objectives and initiated communication strategies to overcome the challenges they associated with textual communication and collaboration in online groups. The learners' sense of place, participation in collaborative activities and communication strategies promoted the development of open, supportive relationships in large and small groups. The openness of those relationships facilitated a conversational mode of learning, which necessitated remembering,

negotiating and articulating experience, knowledge and understanding. The connections between, and support among, learners promoted a sense of community. The learners' ability to share and model experiences, knowledge and understanding, combined with their perceptions of one another, led to increased understandings of self and others and resulted in personal and collective transformations.

The theory has implications for educational practice as it reveals information about conditions for effective learner-learner interaction and knowledge construction in online courses. These findings are significant because they demonstrate that undergraduate learners participating in a first year online course can develop close relationships with peers and a sense of community. They also experienced learning which led to personal and collective transformation within a 12 week term.

Certification of Dissertation

I certify that the ideas, experimental work, results, analyses, and conclusions reported in this dissertation are entirely my own effort, except where otherwise acknowledged. I also certify that the work is original and has not been previously submitted for any other award, except where otherwise acknowledged.

15 January 2010

Signature of Candidate

Date

ENDORSEMENT

Signature of Supervisor/s

Date

Signature of Supervisor/s

Date

Acknowledgements

I would like to thank the following people for their advice, support and encouragement which sustained me and enabled this dissertation to be written:

- The participants who allowed me to share their learning journeys and exemplified the intellectually challenging and engaging nature of online learning and teaching.
- My principal supervisor, Associate Professor Patrick Danaher, who gave generously and unfailingly of his time to assist me with so many things, from the intellectual to the academic and from the emotional to the administrative processes of thinking, writing and completing.
- My associate supervisor, Dr Shirley Reushle, who provided a balance of support, encouragement, and challenge in the latter stages of candidature.
- Associate Professor Peter Albion, who fulfilled the role of principal supervisor in the early stages of candidature.
- The Faculty of Education, University of Southern Queensland, for its administrative support throughout the process.
- Those friends and acquaintances, who were interested enough to enquire how work was progressing and polite enough to listen when I felt I had something to say and who were also prepared to take second place, particularly when deadlines were looming. Special thanks to the Yeppoon triathletes who encouraged me to take regular exercise breaks or at the very least a caffeine hit.
- Most importantly, my family, especially Jim for his patience, understanding, support and unwavering belief in me, but also for the time he spent listening, reading and questioning what I had to say, which enhanced my understanding of the points I was trying to make and therefore contributed, in no small measure, towards this dissertation. Also my sister, Carol, who by some sixth sense knew just when to prod me into action!

Table of Contents

Abstract.....	i
Certification of dissertation.....	iii
Acknowledgements.....	iv
List of figures... ..	viii
List of tables.....	ix
Publications arising from PhD research.....	x

CHAPTER 1 - INTRODUCTION

1.1 The research problem.....	1
1.1.1 Intrinsic interest	3
1.1.2 Instrumental motivation.....	5
1.2 The purpose, context and scope of the study	9
1.2.1 The research questions.....	11
1.3 Significance of the research	13
1.4 Organisation of the dissertation	14
1.5 A personal theory of learning and instruction.....	15

CHAPTER 2 - LITERATURE REVIEW

2.1 Introduction.....	20
2.2 Distance education	23
2.2.1 The evolution of distance learning	24
2.2.2 Historical models, assumptions and implications for online learning	26
2.2.3 Recognition of the need for further research and a theoretical framework	30
2.3 Knowledge construction	31
2.3.1 The nature of knowledge	32
2.3.2 The range and dimensions of constructivism	35
2.4 Learner interaction	40
2.4.1 Types of interaction	40
2.4.2 Challenges associated with the absence of definitional consensus.....	43
2.5 Textual communication	44
2.5.1 Online learning contexts	45
2.5.2 Asynchronous and synchronous communication	46
2.6 Collaborative learning.....	49
2.6.1 Models for the analyses of learner interaction and knowledge construction.....	51
2.6.2 Reiteration of the need for an integrative theory	57
2.7 Summary of the chapter	59

CHAPTER 3 - THEORETICAL FRAMEWORK

3.1 Introduction.....	62
3.2 Theoretical sensitivity	63
3.3 Vygotsky's genetic theory of learning and development.....	65
3.3.1 Semiotic mediation	68
3.3.2 Zone of proximal development.....	72
3.3.3 Genetic analysis.....	74
3.4 Summary of the chapter	79

CHAPTER 4 - RESEARCH DESIGN

4.1 Introduction.....	80
4.2 Philosophical and theoretical perspectives.....	81
4.2.1 A qualitative framework of study	83
4.2.2 The research problem	84
4.3 Research strategy: A single case study with embedded case design.....	85

4.3.1 Case study research	87
4.3.2 Embedded case design.....	87
4.3.3 Instrumental and intrinsic case studies	88
4.3.3.1 Selection of the case.....	89
4.3.4 The case: Online communication course.....	91
4.3.4.1 Background	91
4.3.4.2 Educational philosophy and andragogical framework	92
4.4 Methods of data collection and analyses.....	96
4.4.1 Data collection.....	98
4.4.1.1 Participants.....	99
4.4.1.2 Activities	99
4.4.1.3 Documents.....	100
4.4.1.4 Sequence and purpose of data collection	101
4.4.2. Data analysis: Social network analysis.....	102
4.4.2.1 Procedures and treatment of data	106
4.4.3. Data analysis: Constant comparative method and constructivist grounded theory	108
4.4.3.1 Procedures and treatment of data	112
4.4.3.1.1 Initial and theoretical sampling.....	112
4.4.3.1.2 Initial coding	115
4.4.3.1.3 Focused coding	117
4.4.3.1.4 Axial coding.....	118
4.4.3.1.5 Theoretical coding and construction of a grounded theory.....	121
4.4.3.1.6 Constant comparative method.....	124
4.4.3.1.7 Memo writing.....	124
4.5 The art, practices and politics of interpretation and evaluation	124
4.5.1 Ethical considerations.....	125
4.5.2 Interpretation and narration	127
4.5.3 Criteria for evaluation.....	129
4.5.3.1 Triangulation	131
4.5.3.2 Audit trail	132
4.5.3.3 Transferability	133
4.6 Summary of chapter.....	134

CHAPTER 5 - LEARNING RELATIONSHIPS IN ONLINE CONTEXTS: A SUBSTANTIVE THEORY

5.1 Introduction.....	135
5.2 Developing learning relationships as a core category.....	136
5.3 Contextual conditions: Textual communication and groups.....	143
5.4 Intervening condition: Participation.....	144
5.4.1 Active and interactive participation.....	146
5.4.2 Density.....	147
5.4.3 Prominence	150
5.4.4 Forms of interaction.....	152
5.5 Intervening condition: Communication strategies	155
5.5.1 Asynchronous and synchronous communication	156
5.5.2 Adaptations for textual communication.....	163
5.5.3 Protocols for group interaction	166
5.6 Action/interaction: Developing relationships with peers.....	172
5.6.1 Stages in relationship development in online contexts.....	174
5.6.2 Dimensions of and processes in learning relationships	177
5.6.2.1 Contact and comfort.....	177
5.6.2.2 Involvement and trust.....	178
5.6.2.3 Intimacy, investment and commitment	181
5.6.2.4 Deterioration, repair and dissolution.....	182
5.7 Action/interaction: Constructing and reconstructing knowledge.....	186

5.7.1 Learner perceptions	187
5.7.2 Dimensions of learning and the processes of knowledge construction	192
5.7.2.1 Remembering	194
5.7.2.2 Internal negotiation	199
5.7.2.3 Social negotiation	200
5.7.2.4 Articulation.....	205
5.8 Consequence: A sense of community	208
5.9 Consequence: Knowledge and understanding	216
5.9.1 Increased awareness: Self and others	217
5.9.2 Transformational learning: Personal and collective	220
5.10 Modelling learning relationships as a substantive theory	223
5.11 Summary of the chapter	225
CHAPTER 6 - SUMMARY, DISCUSSION AND CONCLUSION	
6.1 Introduction.....	229
6.2 Locating the study and results within the substantive area of online learning.....	230
6.2.1 Online learning contexts	235
6.2.2 Asynchronous and synchronous communication	236
6.2.3 Collaborative learning	237
6.3 Evaluating the relevance of Vygotsky's theory of development as a conceptual framework	241
6.3.1 Semiotic mediation	243
6.3.2 Zone of proximal development.....	246
6.3.3 Genetic analysis.....	250
6.4 Exploring the significance of transformation as a consequence of learning relationships in online contexts.....	252
6.5 Examining the study's contribution to methodological knowledge.....	260
6.6 Limitations of the study	263
6.7 Future research.....	264
6.8 Conclusion	266
6.9 Reflection on and articulation of personal transformation.....	268
REFERENCES	273
APPENDICES	
Appendix A: Extract from the file uploaded to the InFlow software program	294
Appendix B: Example of initial coding and an associated procedural memo	295
Appendix C: Examples of focused coding and associated procedural memos	296
Appendix D: Assessment criteria for individual and group activities	299
Appendix E: Contribution from Jenny LGDW6.....	300

List of Figures

CHAPTER 1 - INTRODUCTION

- Figure 1.1 Overview of the purpose, context and scope of the study 12
Figure 1.2 A personal theory of learning and instruction 17

CHAPTER 2 - LITERATURE REVIEW

- Figure 2.1 A conceptual overview of distance education and online learning 22
Figure 2.2 Towards a model of online learning 59

CHAPTER 3 - THEORETICAL FRAMEWORK

- Figure 3.1 Conceptualisation of Vygotsky's theory of development 68

CHAPTER 4 - RESEARCH DESIGN

- Figure 4.1 Elements of the research process and the relationships among them 80
Figure 4.2 Overview of the research strategy 86
Figure 4.3 Overview of the communication course 94
Figure 4.4 Retrospective overview of the case study.....98
Figure 4.5 A Directional and valued sociogram 104
Figure 4.6 Overview of coding procedures within the study 115
Figure 4.7 Category development 119
Figure 4.8 Abbreviated illustration of the axial category learner-learner interaction 120
Figure 4.9 Abbreviated illustration of the axial category knowledge and understanding..... 120

CHAPTER 5 - LEARNING RELATIONSHIPS IN ONLINE CONTEXTS: A SUBSTANTIVE THEORY

- Figure 5.1 Overview of axial and core categories developed during the study 138
Figure 5.2 Example of category formation within learner-learner interaction... 141
Figure 5.3 Overview of learning relationships as a core category 142
Figure 5.4 Interaction in the large group during week 6..... 147
Figure 5.5 Overview of discussion threads and conversation strings from the
large group: Week 6.....154
Figure 5.6 Overview of asynchronous communication within the large group157
Figure 5.7 Overview of asynchronous communication within the small groups.....158
Figure 5.8 Differentiation of the use of asynchronous communication in small groups.....159
Figure 5.9 Differentiation of the use of synchronous communication in small groups160
Figure 5.10 Overview of learner-learner interaction within the small groups162
Figure 5.11 Stages of relationship development within the online course175
Figure 5.12 Learner-learner interaction and relationship development in the large group...176
Figure 5.13 Learner-learner interaction and relationship development in the small groups.176
Figure 5.14 Dimensions of learning and the processes of constructing and
reconstructing knowledge.....194
Figure 5.15 Evolution of a sense of community in the small online learning groups.....213
Figure 5.16 Modelling learning relationships in online contexts as a substantive theory.....225

CHAPTER 6 - SUMMARY DISCUSSION AND CONCLUSION

- Figure 6.1 Location of the study in relation to online learning theory.....232
Figure 6.2 The study's contribution to the development of a theory of online learning.234
Figure 6.3 Conceptual links between Vygotsky's theory of development and the case.....243
Figure 6.4 Research results framed by a conceptual model of Vygotsky's theory of
development.....248
Figure 6.5 The process and case specific dimensions of personal and collective
transformation.....255
Figure 6.6 Overview of the research study267
Figure 6.7 Process and dimensions of the personal transformation of the researcher.....271

List of Tables

CHAPTER 4 - RESEARCH DESIGN

Table 4.1 Paradigmatic issues and philosophical assumptions from a constructivist perspective	82
Table 4.2 Assessment items within the communication course	95
Table 4.3 Overview of objectivist and constructivist perspectives of grounded theory	109
Table 4.4 Sequence and purpose of initial and theoretical sampling within the case.....	113
Table 4.5 Delineation of course co-ordination and research roles during course delivery	126
Table 4.6 Strategies utilised to enhance the trustworthiness, credibility and transferability of the research findings.....	130
Table 4.7 Methods of triangulation utilised within the study	131

CHAPTER 5 - LEARNING RELATIONSHIPS IN ONLINE CONTEXTS: A SUBSTANTIVE THEORY

Table 5.1 Overview of participant interaction and measures of density within the large group.....	148
Table 5.2 Comparison of measures of density and number of posts to large group discussions.....	148
Table 5.3 Overview of learner activity and participation in large group discussions.....	149
Table 5.4 Comparison of the use of asynchronous communication within the small groups and the large group.....	158
Table 5.5 Comparison of the use of synchronous communication within small groups.....	160

Publications arising from PhD research

Rossi, D., & Singh, G. (2007). Investigating knowledge construction in organisational and educational contexts: A social constructivist perspective. In R. Chapman (Ed.), *Managing our intellectual and social capital: Proceedings of the 21st ANZAM Conference* (pp. 1-14). Canning Bridge, Western Australia: Promaco Conventions Pty Ltd.

Rossi, D. (2008). Online learning communities: Adopting a learner centred perspective to frame lifelong learning futures. In D. Orr, P. A. Danaher, G. Danaher & R. E. B. Harreveld (Eds.), *Lifelong learning: Reflecting on successes and framing futures. Keynote and refereed papers from the 5th International Lifelong Learning Conference* (pp. 333-337). Rockhampton, Australia: Central Queensland University.

Rossi, D. (2008). Reflecting on research practice: A retrospective means of framing future learning. In D. Orr, P. A. Danaher, G. Danaher & R. E. B. Harreveld (Eds.), *Lifelong learning: Reflecting on successes and framing futures. Keynote and refereed papers from the 5th International Lifelong Learning Conference* (pp. 338-341). Rockhampton, Australia: Central Queensland University.

Rossi, D. (2009). Relationships with peers enable 1st year students to negotiate and surmount social and educational challenges within virtual learning communities. *Studies in Learning Evaluation Innovation and Development*, 6(1), 98-111.

CHAPTER 1

INTRODUCTION

1.1 The research problem

With the development of the Internet, and with the increasing pervasiveness of communication between networked computers, we are in the middle of the most transforming technological event since the capture of fire... (Barlow, 1995, as cited in Haythornthwaite & Wellman, 2002, p. 35).

Today's rapidly expanding Internet connects more than a billion people worldwide and affects human communication in profound ways (Luppicini, 2007). The development and implementation of technology have placed the educational environment in a state of flux (Andrews & Crock, 1996). Most colleges and universities offer some form of distance education and many institutions have begun to invest heavily in on-line teaching (Bartolic-Zlomislic & Bates, 1999). In Australia this investment has been apparent in government policy which has placed increasing emphasis on flexible learning and online delivery (Kilpatrick & Bound, 2003). With the election of the Australian Labor Party (ALP), in November 2007, the *Digital Education Revolution* became an Australian government policy (Australian Government Department for Education, Employment and Workplace Relations (DEEWR), 2008).

The online environment is acknowledged to represent one of the fastest growing contexts for adult learning (Smith, 2008), yet it has been reported, by academic leaders, that faculty often do not accept the value of online learning (Allen & Seaman, 2007). Moreover, while online learning is bringing fundamental change to the development of education and training and the way people learn, the potential of online education within the higher education sector remains largely unknown. In addition, online learning is perceived suitable for some student groups but not others and it has been suggested that this mode of education has a wider applicability and

acceptance among postgraduate students (Bell, Bush, Nicholson, O'Brien & Tran, 2002). This perception may, however, be related to the availability of online offerings, as in 2001, 90% of the fully online courses offered by Australian universities were at postgraduate level (Bell et al., 2002).

There is recognition that the inclusion of technologies in education represents change at every level including: pedagogy, curriculum, policy, infrastructure, and organisation and governance at institutional and system levels (Moyle & Owen, 2008). In this respect, technological innovation is creating a relentless demand for new skills (Hodgins, 2000) and presents a number of challenges for teachers facilitating and students learning in computer-mediated contexts (Andrews & Crock, 1996; King, 2002; Rourke, Anderson, Garrison, & Archer, 1999). While the issues associated with online education are complex, without proper regard to appropriate pedagogy and the needs of students in online contexts, online learning solutions are destined for failure (Bell et al., 2002).

Online environments provide an educational domain unique in their potential for interaction, participation and collaboration (Kumpulainen & Mutanen, 2000). Although scholars are aware that technological advances are changing access to knowledge, the process of learning and the delivery of education (Hodgins, 2000); the focus, in terms of instructional design and course development, has consisted of converting traditional content into a technical format (Ladyshevsky, 2004). Because of the interactive capacity of the medium (Leasure, Davis, & Theivon, 2000; Rourke et al., 1999) there is a perception that the potential of, and the opportunities for, online learning contexts have been poorly exploited (Oliver & Herrington, 2003).

Interest in, and motivation for, this research evolved from the educational practice of the researcher who developed and implemented an online course in an undergraduate program offered by a regional university in Australia.

1.1.1 Intrinsic interest

An opportunity arose in 2004 to remodel a communication course for online delivery. Historically, the course had been offered on-campus (across multiple campuses) and off-campus (through print based materials). Course content introduced learners to different types of communication within a broad range of health care settings and facilitated the exploration of communication techniques within groups, with a view to improving health outcomes through effective communication. However, course evaluations from on-campus students indicated a desire for more discernable links between course content and the application of communication theory in health settings. Off-campus students expressed a perceived inequity in their ability to engage with the educator and fellow students, in course materials and assessment items. The intention, within the 2004 offering, was to structure an authentic learning experience, with clearly demonstrable links between content and practice and to provide the cohort of off-campus students with an interactive learning experience that would reflect the educational experience of on-campus students. In essence, the redesign afforded a means of structuring the course to enhance quality and to meet the perceived needs of both student groups (Rossi & Hinton, 2005). The course also provided the course co-ordinator, who was also the researcher, with an opportunity to explore the use of technology in teaching practice, as she had had no previous exposure to facilitating or learning in an online context.

The course was a pilot for the learning management system (LMS), Blackboard, which had been newly adopted by the University. It was also unique in

that it was the first fully online course within the educational program and the first to be offered by the School. Over time, most courses integrated one or more of the communication tools afforded by Blackboard (such as discussion boards and email lists), but the communication course remained the only course designed to support substantial and sustained learner-learner interaction. Despite the co-ordinator's pedagogical intent she continued to question and discuss with peers whether a technological approach was appropriate in a course that required the development of a range of interpersonal and professional communication skills. Although the online medium was considered a suitable alternative for distance education students, there was an underlying assumption that these skills may be more effectively learnt within a traditional educational setting. Her reservations about the use and the capacity of technology were shared by fellow academics and professional colleagues. More concerning was a later discovery that some authorities were of the view that a LMS such as Blackboard, which majored in content delivery, did not lend itself to student centred teaching and learning (Blacker, 2005).

A decision was taken by the School to offer the course online only. Despite the initial resistance of learners to their transfer to an online mode of learning and complaints about the time learners felt compelled to spend completing online learning activities, it became apparent that learners recognised and valued their interactions with others within the online course. As co-ordinator I became aware of the visibility of student exchanges and drew comparisons between online and face-to-face settings. On reflection, I realised that in a face-to-face context an educator's presence may be perceived as an intrusion and inhibit interaction within a collaborative group. Moreover, only one group or interaction could be observed at any given time, which was not the case in the online context. Students were also able

to demonstrate knowledge and understanding in their online contributions and there were observable differences in the depth of student learning which could be observed, monitored and redirected (Rossi & Hinton, 2005).

Based on my experience of coordinating offerings of the online course in 2004 and 2005, I was of the opinion that appropriately structured online courses had the potential to facilitate the effective learning of theory and skills but could also promote and perhaps enhance student learning. Through educational literature I became aware that although there had been claims of pedagogical benefits from online learning environments there was a lack of empirical data (Rourke et al., 1999) and that little was known about which teaching and learning practices contributed to positive outcomes in online courses (Billings, 2000). As a result, I found myself with something of an educationally disorienting dilemma as my perceptions of online learning contexts were not shared, and at times were disputed, by peers or professional colleagues and I could not support my observations with empirical evidence. Indeed certain literature appeared to contradict both my observations and my online experience.

1.1.2 Instrumental motivation

It has been argued that a systematic enquiry of educational interactions can yield understandings and insights about the relationship between teaching and learning and more importantly that unless educators are able to create links between their teaching and student learning it may be difficult for them to improve practice and therefore student learning (Lally & De Laat, 2002). From my perspective research appeared an appropriate response to my educational dilemma. I was further motivated by the assertions of others that despite the considerable effort expended to develop and implement online learning environments they often fail to create

effective settings for learning and knowledge construction (Oliver & Herrington, 2003).

Research suggests that a dynamic, interactive, educational process that facilitates critical thinking is dependent on several factors, which include: an appropriate course design, the interventions of the instructor, course content and student characteristics (Bullen, 1998). These findings are supported by the work of Chang (2002), who has determined that asynchronous learning can promote critical thinking if supported by a constructivist instructional design, cooperative or collaborative learning, critically reflective learning strategies and opportunities to engage multiple perspectives. Despite the many versions of constructivism the unifying concepts are that learning and understanding are inherently social rather than individual and that cultural activities and tools are integral to conceptual development (Palinesar, 1998). Thus in order to understand phenomena related to learning from a constructivist perspective, it is necessary to examine the ways in which learners interact with one another (Stahl & Hesse, 2006).

Interaction among learners is acknowledged to make a positive contribution towards student learning and recognised as a significant component of successful online learning (Su, Bonk, Magjuka, Lui, & Lee, 2005). Online interactions tend, however, to be unusually complex owing to the nature of the online environment, which is computer-mediated, text-based and time dependent (Gunawardena et al., 2001). In these contexts text assumes the fundamental form of an exchange, representing the dialogue and interaction between communicators. Although interaction is considered the key to co-construction and cognitive change, student contributions via electronic posts often lack interactive characteristics (Davis & Rouzie, 2002). While some researchers are of the view that online contexts create a

unique social climate that impacts upon interactions and group dynamics (Gunawardena et al., 2001), others maintain that two-way interaction is not an inherent part of technology and argue that interaction and learning may not occur if the social structure of the course permits passive compliance. This suggests that the results of learner interaction may be tied to the instructional design of the course (Chou, 2002).

Although a number of studies have examined the concept of interaction, there is a lack of definitional consensus (Beuchot & Bullen, 2005). Confusion appears to arise because the term “interaction” is often used interchangeably with “interactivity”. Su et al. (2005) differentiate between the two, suggesting that interaction is process orientated and focused on dynamic actions, while interactivity is feature orientated and emphasises system characteristics or the degree of interaction. Thus interactivity could be interpreted as the level of participation. Berge (1999) describes interaction in distance education as a two-way communication among two or more people within a learning context, with the purpose of task, instructional completion or social relationship building. The question of how learners interact in computer-supported, group-based learning has received increasing research attention (Strijbos, Martens, & Jochems, 2004), yet little is known about the dynamics and processes of learner-learner interaction and how these relate to learning (Kumpulainen & Mutanen, 1999; McLoughlin & Luca, 1999). This finding indicates a continuing need to examine the processes of interaction and knowledge construction within online learning groups.

Peer group learning has long been recognised for its positive effects on academic achievement (E. Cohen, 1994) and recognition of the value of interaction has resulted in increases in peer interaction within many classrooms. This trend is

also evident in online environments through the implementation of student-centred learning activities, collaborative working modes, authentic learning contexts and technological innovations which provide learners with more opportunities to participate, observe, reflect on and practise socially shared ways of knowing and thinking (Kumpulainen & Mutanen, 2000). Previously, learner-learner interaction had been downplayed in distance education (Anderson, 2008b) but, given the capacity of online learning contexts, researchers are increasingly recognising the importance of understanding how meanings and knowledge are constructed by learners while they work in small groups on various learning activities (Kumpulainen & Mutanen, 2000). There is also interest in the analyses of the interactions of individuals as learning entities and between learners in groups as separate learning entities (Lally & De Laat, 2002) which may be related to the current prevalence of constructivist views of learning.

Although constructivist theories are frequently utilised as conceptual frameworks in the analyses of computer-mediated discussions and knowledge construction in online learning environments (Hendriks, 2002; Schrire, 2002; Veldhuis-Diermanse, 2002), the relationship between social constructivism and online communication is considered tentative and not fully supported by previous research (Hendriks & Maor, 2004). It is conceivable that this situation has arisen because researchers are still developing research methods consistent with the assumptions of a social constructivist perspective (Palinesar, 1998; Wertsch, 1995). If so, then it may also be true that current theories and existing research approaches do not explain what tools learners use or, how they articulate knowledge or develop shared understandings which bring about conceptual change (Stahl, 2006).

Research has failed to show how interaction is used to create knowledge and understanding (Hendriks, 2002). As an educator and researcher I am interested in and motivated to seek an understanding of, how learners interact and construct knowledge as they collaborate in groups to complete learning activities using synchronous and asynchronous communication. I believe an understanding of these processes will provide insights about the relationship between learner interaction and knowledge construction in diverse computer-mediated contexts. As an educator my understanding of these phenomena will inform my teaching practice, enhance the instructional design of future online courses and contribute towards the further development of my personal philosophy of learning and instruction. As a researcher I anticipate being able to participate in empirical, theoretical and methodological conversations about the nature of learner-learner interaction and knowledge construction in groups engaged in collaborative activities in online learning contexts.

1.2 The purpose, context and scope of the study

The purpose of this research was to understand the processes of, and the relationship between, learner-learner interaction and knowledge construction in online learning contexts. The research strategy selected to achieve the aims of the investigation was a single case study with an embedded case design. This strategy suited the social structure of the course and facilitated the analyses of two complex social processes in diverse, but related, learning contexts.

The course, which constituted the case, was an undergraduate unit of study offered by a regional university in Australia. The university offers a wide range of undergraduate and postgraduate programs courses both on-campus and off-campus. The communication course was a first year unit of study within a Health Promotion degree and an elective for several different programs offered across faculties

throughout the university. Learners participating in the study were enrolled in eight different undergraduate programs. The course was available from 6 March to 2 June 2006 and participants consisted of 20 students and one course co-ordinator, responsible for managing the course during the academic term. As a case, the course offered an opportunity to examine the phenomena within an authentic educational setting, among a single cohort of students in groups of different sizes as they engaged in synchronous and asynchronous discussion to complete collaborative learning activities.

Case study is particularly suited to the investigation of contemporary phenomena within real-life contexts, especially when the boundaries between the phenomena and the context are not clearly evident and when ‘how?’ or ‘why?’ questions are being asked about a set of events (Yin, 2003). Merriam (2002) emphasises that it is the unit of analysis, not the topic of investigation, that characterises a case study, the key determinant being whether the case can be contained in some way (Merriam, 1998; Miles & Huberman, 1994; Yin, 2003). One or more groups may be selected as a unit of analysis when certain characteristics associated with the group are thought to have significant implications for the case being investigated (Patton, 2002). The units need not be mutually exclusive and the investigation of multiple units offers an opportunity to emphasise different aspects of the case, provide a different focus for the analysis of data and identify different levels at which statements about findings and conclusions may be made.

Within this case interaction and knowledge construction occurred among learners through synchronous and asynchronous communication. In previous research Moore (1989) identified three different types of learner interaction: learner-content, learner-instructor and learner-learner. A fourth, that of learner-interface,

was later added by Hillman, Willis and Gunawardena (1994), who acknowledged that learners must also interact with the technological medium in order to interact with the content, instructor or other learners in online environments. More recently Anderson (2008b) has acknowledged six forms of interaction within online learning contexts; these include student-content, student-teacher, student-student, content-content, teacher-teacher and teacher-content. The primary focus within this investigation was learner-learner interaction and the relationship between it and knowledge construction in online contexts.

1.2.1 The research questions

Figure 1.1 provides an overview of the strategy and identifies the case and three units of analysis. A series of questions were formulated to guide the collection and analyses of data from the case; these were: how do learners interact and construct knowledge within a large, asynchronous discussion group? How do learners interact and construct knowledge within small groups in asynchronous and synchronous environments? How do individual learners conceptualise interaction and knowledge construction within the context of an online course? And in what ways do learner perceptions shape communication and learning in online groups?

Two diverse but complementary methods were used to examine and understand the relationship between learner interaction and knowledge construction within online learning contexts. These were SNA and constant comparative method, which incorporated the analytical procedures associated with constructivist grounded theory. The use of these methods facilitated a macro level analysis of the interactions that facilitated knowledge construction within the course and micro level analyses of the processes of interaction and knowledge construction, during synchronous and asynchronous discussion.



Figure 1.1 Overview of the purpose, context and scope of the study

1.3 Significance of the research

Most studies investigating computer-mediated interaction and knowledge construction have been levelled at postgraduate or professional courses or programs, which have for the most part been offered as further education for teachers (Gunawardena, 1995; Hendriks, 2002; Hendriks & Maor, 2004; Kanuka & Anderson, 1998; Schrire, 2002). As a result little attention has been paid to the processes of interaction and knowledge construction of undergraduate learners in online contexts. By contrast, students within this study were predominantly in their first year and were enrolled in an undergraduate program. The findings of this study therefore contribute to a currently limited body of knowledge about the patterns of interaction and processes of knowledge construction of undergraduate students in online learning contexts.

The significance of online learning contexts (Gunawardena et al., 2001) and learner perceptions of them (Meyer & Muller, 1990) have been acknowledged in previous studies however, few, if any, have analysed the processes of learner-learner interaction and knowledge construction as students engage in learning activities in groups of different size, communicating both synchronously and asynchronously. The integrated analyses from this case therefore reveal important information about conditions for effective interaction and learning within online courses and have the potential to make a constructive contribution to the instructional design of online learning contexts and teaching practice.

Despite current rhetoric there is limited empirical evidence to support links between computer-mediated communication and social constructivist theories of learning and previous studies have been unable to explain how interaction is used to create knowledge and understanding. The selection of a single case study with

embedded case design has facilitated the analyses and understanding of learner-learner interaction and knowledge construction within a single cohort of students from both social and individual perspectives. To the researcher's knowledge, this type of analyses is unprecedented and therefore the findings from this research represent an original contribution to empirical, methodological and theoretical knowledge.

1.4 Organisation of the dissertation

The content of this dissertation has been organised in six chapters. This chapter has outlined the research problem and acknowledged intrinsic interest in and instrumental motivation for the study. It has also delineated the purpose, the context and the scope of the investigation and specified the significance of the research. Chapter 2 presents a literature review of previous research which investigates various aspects associated with online learning, including knowledge construction, learner interaction and collaborative learning. The aim of the review is to identify and clarify the research problem and to locate potential deficits in empirical knowledge. The review therefore also serves to position the current study and its contribution to knowledge. Chapter 3 acknowledges Vygotsky's theory of development, a potentially useful lens through which to view the data collected from this case. From the theory three constructs are examined: semiotic mediation, zone of proximal development (ZDP) and genetic analysis. Chapter 4 outlines and justifies the research design. Discussed in detail are the implications of the philosophy and theoretical perspective of the researcher, the research strategy, methods of data collection and data analysis and the art, practices and politics of interpretation and evaluation. Chapter 5 presents a substantive theory of learning relationships in online contexts, which was constructed from the integrated analyses of learner-

learner interaction and knowledge construction within the online course. Emphasis is placed on the conditions, actions, interactions and consequences of learning relationships in online contexts. The chapter concludes with a conceptual model of the theory. Chapter 6 summarises and discusses the significance of the study and the educational implications of learning relationships as a theoretical construct by locating the study and the results within the substantive area of online learning, evaluating the relevance of Vygotsky's theory of development as a conceptual framework and exploring the importance of transformation as a consequence of learning relationships in online contexts. The final chapter also examines the study's contributions to methodological knowledge and the limitations of the research and identifies issues arising from this work which merit further investigation.

1.5 A personal theory of learning and instruction

The beliefs, knowledge and experience of the researcher are acknowledged to play a significant role in the research process, influencing identification of the research problem, the selection of a research strategy and the methods used to address research questions (Charmaz, 2006; Merriam, 1998; Piantanida, Tananis, & Grubs, 2004). Thus far I have acknowledged personal interest in the course selected as a case, described the research strategy, outlined the research questions and identified two methods of analysis. As this investigation originates from educational practice and is located within a qualitative paradigm, it is appropriate to offer biographical data which may clarify personal assumptions and views about learning and instruction which had the potential to influence this research. This information is relevant because my educational philosophy is reflected in the learner-centred design of the online course, my actions and interactions as course co-ordinator and my

understanding and my interpretation of knowledge and how knowledge was constructed by learners within the course.

I view myself as an adult learner in continuous pursuit of personal and professional development. I am also a reflective practitioner with a broad range of experience in health care and educational settings. I have studied and been employed as a registered nurse, midwife, community nurse, educator and academic in clinical and community settings in both developed and developing countries. My roles and responsibilities have exposed me to a diverse range of knowledge, experience and teaching and learning practices; it is this knowledge and experience that informs and constitutes the basis of my educational philosophy.

Figure 1.2 offers a personalised adaptation of a process that Driscoll (1994) associates with the construction of a personal theory of learning and instruction. The diagram identifies my beliefs and assumptions about learning, theories of learning which reflect my character, my motivations and pursuits as an adult learner, learning contexts that I have designed course for and implemented courses in and examples of formal sources of theoretical and pedagogical knowledge. Constructivism and transformational learning are shown as elements currently in the process of integration; knowledge of these constructs is based on recent reading and increased understanding as a result of this study.

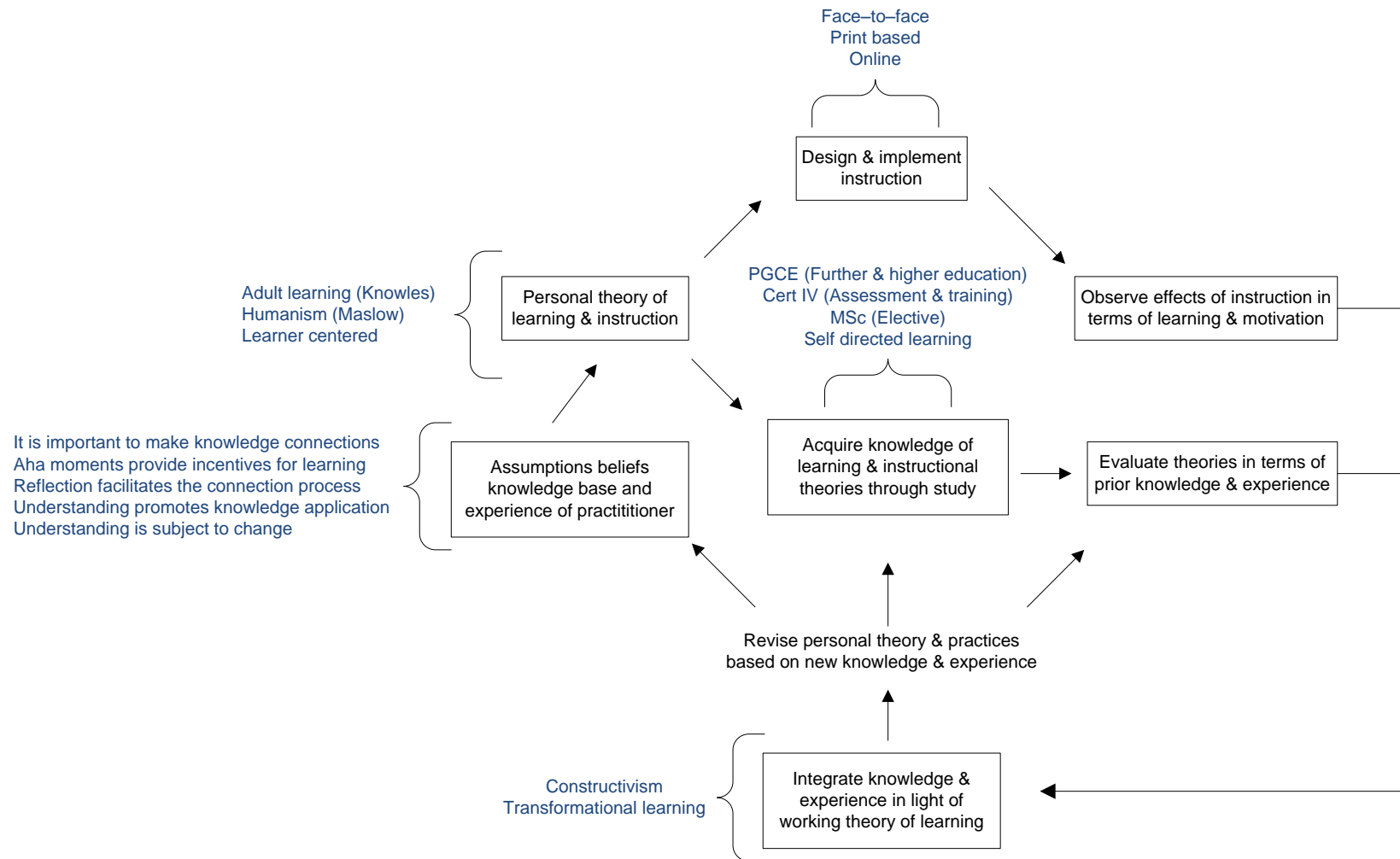


Figure 1.2 A personal theory of learning and instruction (adapted from Driscoll, 1994, p. 380)

In acknowledging that the identification of particular theorists and theories offers little insight about their personal significance, or their relevance in relation to this study, I draw attention to aspects of Maslow's theory of motivation (Maslow, 1943) and Knowles's theory of adult learning (Knowles, 1990) which are personally meaningful.

I associate my pursuit of personal and professional development with Maslow's concept of self-actualisation, which relates to the actualisation or attainment of individual potential, capacity and talent. Given my motivations and characteristics as a learner, I found the theorists conclusions about those who achieve self-actualisation intriguing and personally relevant. Maslow asserts that those who achieve self-actualisation, compared to most people, maintain certain independence, are less conforming and are primarily motivated by their own inner growth and the development of their potential. As a theorist, Maslow is reputed to have drawn heavily from the developmental tradition and was of the view that social and educational practices should be evaluated not in terms of how efficiently they control the learner but according to how well they support and nourish inner growth and potential (Crain, 2005). Maslow's theory is not only personally descriptive and insightful but also promotes a learner-centred evaluation of learning.

In an uncannily similar way, Knowles's theory of adult learning and his assumptions about adult learners reflect me and my needs as a mature student. He contends that:

- Adult learners are motivated to learn as they experience needs and interests that learning will satisfy; therefore these needs and interests constitute the appropriate starting points for organising learning activities

- Adult orientation to learning is life centred and that as a result the appropriate units for organising learning are life situations
- Experience is the richest source of an adult's learning; therefore the core methodology of adult education is the analysis of experience
- Adults have a deep need to be self directing; therefore the role of the educator is to engage in a process of mutual enquiry rather than to transmit knowledge and evaluate conformity to it
- Individual differences increase with age; therefore adult education must make optimal provision for differences in style, time, place and pace of learning (Knowles, 1990, p. 31).

What Knowles's theory contributes, both generally and to my theory of learning and instruction particularly, is a set of guidelines for educational practice which, from personal experience, I have found effective. The significance of these two theories and their impact on my philosophy may become more transparent in Chapter 4 when a more detailed account of the teaching and learning strategies implemented within the online communication course is provided.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

Online learning is recognised as a rapidly evolving area within the field of distance education and one acknowledged to challenge educators and learners involved in the process (Andrews & Crock, 1996; Garrison, 2000; King, 2002; Rourke et al., 1999). This study analyses the processes of, and the relationship between, learner interaction and knowledge construction in online contexts. The research problem was derived from an educational dilemma and originated from the personal experience and professional practice of the researcher, as co-ordinator of an online communication course. As intrinsic interest in, and instrumental motivation for, the investigation have already been acknowledged, there is little need to reiterate the researcher's prior knowledge in the fields of education, distance education, and online teaching and learning. There is however, a need to discuss the timing, purpose and presentation of empirical literature within this dissertation.

There is ongoing debate about when, how and what is required in the literature review of a grounded theory study (Charmaz, 2006). Underlying concern relates to the potential forcing of data into pre-existing categories based on previous research, particularly by novice researchers. For this reason, grounded theorists recommend delaying the review to avoid imposing preconceived ideas onto emergent work (Charmaz, 2006; Clarke, 2005; Corbin & Strauss, 2008). The presentation and discussion of literature within this dissertation, for the most part, reflect the purpose and the timing of the review. The literature presented in Chapter 1, examined prior to the investigation, served to frame the research problem and contextualise the study.

The aim of this chapter is to offer an integrated review (Creswell, 2003) which locates and clarifies the research problem, summarises broadly accumulated knowledge about the phenomena of interest within the investigation, highlights important issues that research has left unresolved and initiates conversation about theoretical concerns within the field of distance education (Charmaz, 2006).

In keeping with a grounded theory approach, a comprehensive review was not undertaken prior to the analyses of data from the case (Corbin & Strauss, 2008). Instead, the researcher's engagement with the literature extends beyond the current chapter as it was reviewed to clarify evolving ideas and to draw comparisons between findings from this study and previous research in order to show the fit of the substantive theory and where and how the results of the analyses contribute to knowledge and educational practice (Charmaz, 2006; Corbin & Strauss, 2008). On this basis, elements of the review are presented in Chapter 5, which explains and illustrates the conceptual constructs which form the basis of the substantive theory, and Chapter 6, which explores and analyses the educational implications of the research.

Figure 2.1 illustrates the focus and the content of the literature discussed within this chapter. The review examines the evolution of distance education and the implications of historical models and assumptions for both research and practice. Literature pertinent to the design and implementation of distance education courses in online contexts was also examined. The diagram offers a conceptual overview of distance education and online learning as it constitutes a description and analyses of the literature reviewed. Figure 2.1 shows two means by which knowledge may be constructed and reflects some of the complexity surrounding the concept of learner interaction.

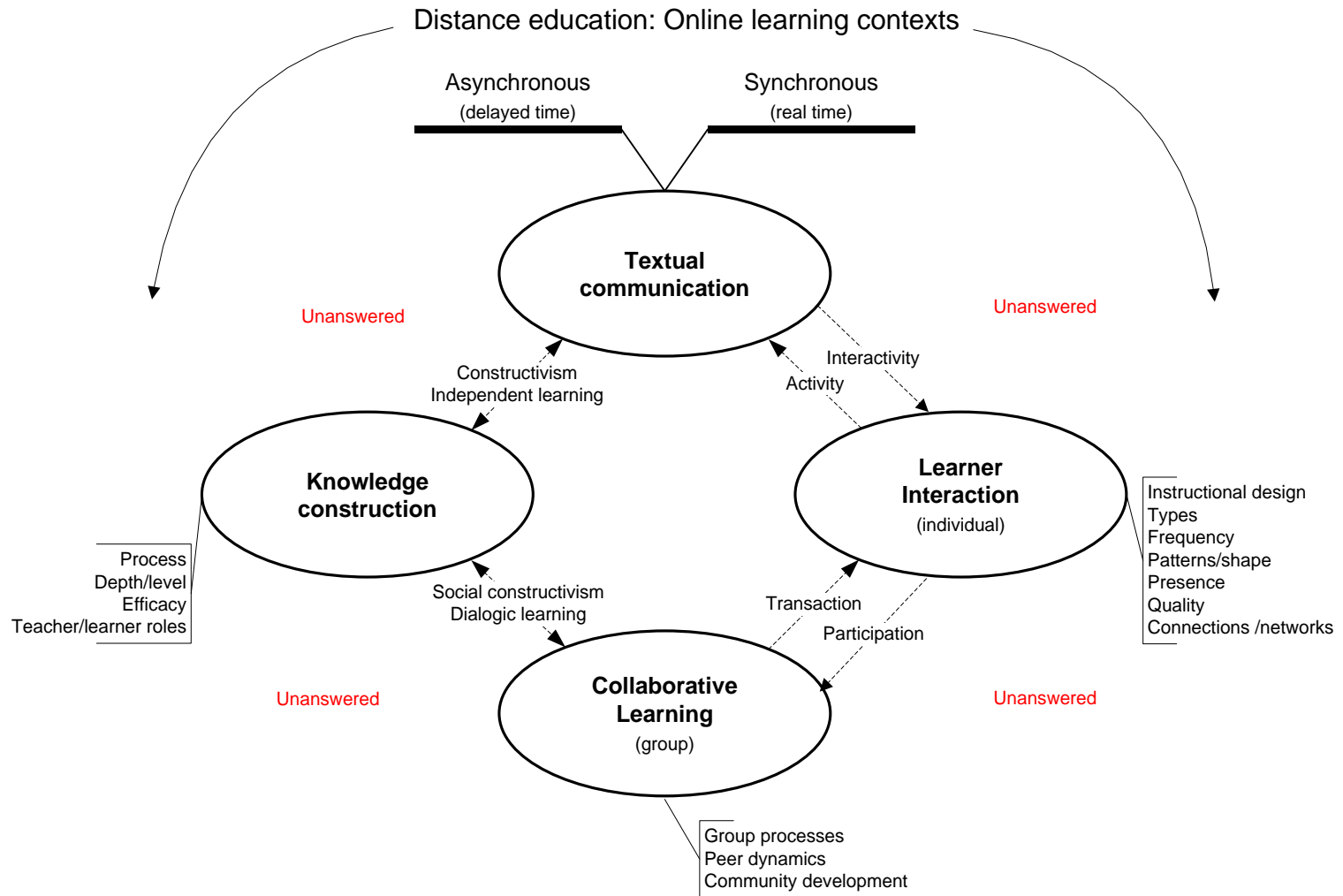


Figure 2.1 A conceptual overview of distance education and online learning

First, the content of this chapter describes the evolution of distance education and locates online learning and this study within this field of education. The following section explores the nature of knowledge and the range and dimensions of constructivism. Different types of educational interaction are then described and the challenges associated with multiple meanings and uses of the term are discussed. Textual communication in online contexts is discussed together with issues related to instructional design. The section on collaborative learning identifies increasing interest in this form of learning and describes models which have, in the past, been used to analyse learner interaction and knowledge construction in online contexts. The discussion draws attention to the move towards the concept of learning communities and reiterates the need for an integrative theory to advance both research and practice.

2.2 Distance education

Distance education has been described as a complex, diverse and rapidly evolving field (Anderson, 2008a), which has moved to the forefront of educational practice owing to unprecedented developments in technology and communication (Garrison, 2000). As noted in Chapter 1, in today's society a rapidly expanding Internet connects more than a billion people worldwide and is acknowledged to affect human communication in profound ways (Luppicini, 2007). Most further and higher educational institutions offer distance education and have begun to invest heavily in on-line teaching (Bartolic-Zlomislic & Bates, 1999). In Australia, this investment has been evident in government policy which has placed increasing importance on flexible learning and online delivery (Kilpatrick & Bound, 2003) and a financial commitment of \$2.2 billion between 2008 to 2012 to fund the *Digital Educational Revolution* (Australian Government DEEWR, 2008). As a result, within

Australia online learning has begun to establish itself as a part of our educational environment, particularly within the higher education and training sectors (Anderson, 2008a).

2.2.1 The evolution of distance learning

Distance education has a long history and is traditionally associated with correspondence study (Garrison, 2000, 2009; Garrison & Archer, 2007; J. C. Taylor, 2001). This is because between 1850 and 1930 postal communication was the only formal system of teaching and learning that enabled learners to overcome barriers of space, time, social place and economic status to pursue learning (Wedemeyer, 1975). However, since then distance education has evolved quickly, keeping pace with technological innovation and developments in communication media, through five, progressive, generations of change (Moore, 2007; J. C. Taylor, 2001).

Change within distance education ranges from the initial correspondence model, which was based on print based technology; to a multi-media model, based on print, audio and video technologies; a tele-learning model, based on applications of telecommunications technologies, which provided opportunities for synchronous communication; a flexible learning model based on online delivery via the Internet which offered synchronous and asynchronous communication; to the fifth and current generation of change, which is described as a model of intelligent flexible learning (Moore, 2007; J. C. Taylor, 2001). Each new model has followed its predecessor more quickly, but has not fully replaced the previous generation; this has resulted in a diverse range of distance education systems which may be used in combination with one another (Anderson, 2008a).

Today the field of distance education is acknowledged to be broad, consisting of component parts and diverse applications, some of which have been articulated in

the terms “distributed learning”, “tele-learning” and “e-learning” and conflated by nomenclatures such as “open learning”, “blended learning” and “flexi-learning” (Moore, 2007). The course which constitutes the case within this study was described by the educational institution as flexible learning and, true to the generational description in the previous paragraph, the course constituted a fourth generation model as it was delivered online via the Internet and offered access to both synchronous and asynchronous communication.

Based on the literature reviewed, online learning is perceived by the researcher to represent one facet in the broad spectrum of approaches which constitute distance education. Although the relationship between distance education and online learning is empirically supported (Anderson, 2008a; Moore, 2007; J. C. Taylor, 2001), it has also been contested as Garrison (2009) asserts that “online learning had its genesis apart from mainstream distance education” and that “online learning approaches have been less about bridging distances and more about engaging learners in discourse and collaborative learning activities” (pp. 93-94). His argument is that online learning emerged from computer conferencing and converged with growing interest in constructivist theories of learning in traditional higher education (Garrison, 2009).

Garrison’s view is considered to represent current assumptions about how knowledge is constructed, rather than an historical perspective of developments in the field. Had his view been accepted it would have been necessary to re-contextualise the current study. Moore (2007) maintains that “...we can say that a program in which the sole or principal form of communication is through technology is a distance education program, and those in which technology-mediated communication is ancillary to the classroom are not a distance education program”

(p. 91). The online course in this study is, in the researcher's view, firmly located within the field of distance education.

Discussion of the evolution of distance education generally, and online learning specifically, is important for two reasons. The first is that the institutional and pedagogical assumptions on which distance education is based have had, and will continue to have, an impact on the design of online courses, the development of online learning contexts and the form that teaching and learning will take. The second is that it is important to locate online learning within the appropriate field in order to evaluate previous research, contextualise current knowledge and ascertain how this study may make a meaningful contribution to both knowledge and practice.

2.2.2 Historical models, assumptions and implications for online learning

Differences in perspectives about the origins of online learning can be linked to suppositions about distance education and how knowledge is constructed. Initially distance education was recognised as an independent form of study, one that relied on self-instructional packages (Garrison, 2009). The term, "independent learning" was used to describe the behaviour of individuals who did not study in class but learned alone, directing their own learning or studying with the assistance of a correspondence course (Garrison, 2000; J. C. Taylor, 2001). In the 1970s, independence was considered *the* distinguishing feature of distance education but it could relate also to learners who engaged in institutionally based courses. As Wedemeyer (1971) explains,

Independent study consists of various forms of teaching-learning arrangements in which teachers and learners carry out their essential tasks and responsibilities apart from one another, communicating in various ways

for the purpose of freeing internal learners from inappropriate class paces or patterns, of providing external learners with opportunities to continue learning in their own environments, and of developing in all learners to carry on self directed learning, the ultimate maturity required of the educated person. (p.550)

Distance education was conceptualised as an independent pursuit and as such was directed towards individuals rather than groups (Garrison, 2000). Critics point out that distance education was rooted in a transmission model of learning (Bullen, 1998). It was also designed to address institutional issues associated with access, efficiency and scale (Peters, 1994) and for learners unable or unwilling to participate in face-to-face courses (Beldarrain, 2006).

The first theoretical analysis of distance education, conducted by Peters (1967), led to the development of a framework which described the administrative and pedagogical practices of distance education (Peters, 1994). Within his analysis, Peters (1967) drew heuristic comparisons between distance education and the processes of industrialised production. His intention was not to equate the teaching and learning processes of distance education with the processes of industrial production but rather to use the structural elements, concepts and principles derived from those theories to interpret the distance study phenomenon (Peters, 1967). Although it was not regarded as a theory of teaching or learning (Garrison, 2009), Peters' industrial model is acknowledged to have made a significant contribution to the organisation of distance education, at a time when the focus was on identifying strategies that could overcome distance and geographical constraints (Garrison, 2000).

Perceptions about the context of distance education, the focus on institutional needs and assumptions about the independence of learners in distance education courses can be found in current conversations about online learning. For example, distance education was recently defined as “institution-based, formal education where the learning group is separated, and where interactive telecommunications systems are used to connect learners, resources and instructors” (Simonson, 2003, p. vii). The benefits of online learning are frequently associated with cost effectiveness, convenience and flexibility (Kilpatrick & Bound, 2003; Leasure et al., 2000) and it has been argued that the current emphasis within higher education is on cost benefits rather than educational issues (Garrison, 2000). Moreover, Peters (2003) holds to his initial view that the primary application of online learning is to support the independence and self-direction of learners.

These assumptions can be seen to have had an impact on, and are currently reflected in, educational practice, specifically in the design of online courses and the teaching and learning strategies implemented within online contexts. Support for this assertion can be found in educational literature which reports that, despite the interactive capacity of the online medium, much of the focus, in terms of instructional design and course development, has consisted of converting traditional content into a technical format (Ladyshevsky, 2004). The transfer of content to an online medium could be conceived as a technical form of transmission and/or correspondence teaching. Given the capacity of the medium (Leasure et al., 2000; Rourke et al., 1999), there is a perception that the potential and opportunities of online learning contexts have been poorly exploited (Oliver & Herrington, 2003). Then again, interactive teaching and learning strategies are recognised as more time intensive and therefore less cost effective than a transmission model of learning.

However, advances in technology and the development of diverse forms of communication have led scholars to challenge the validity of earlier assumptions about independence (Garrison, 2000). Indeed, Peters (1994) has acknowledged that his industrial approach to distance education reduced forms of shared learning and kept learners from personal interactions and critical discourse. By contrast, Moore's (1972) theory of transactional distance included dialogue as a variable (Garrison, 2000). Moore (1972) defined distance education as "the family of instructional methods in which the teaching behaviours are executed apart from the learning behaviours...so that communication between the learning and the teacher must be facilitated by print, electronic, mechanical, or other devices" (p. 76). He envisaged teaching and learning as a system, consisting of three subsystems, which were a teacher, a learner and a method of communication. Each subsystem had characteristics that distinguished it from teaching, learning and communication in face-to-face contexts and his construct of transactional distance related to the interplay between teachers and learners in environments that were spatially separate (Moore, 2007).

Transactional distance is determined by the extent to which learners study alone with their educational materials or whether they communicate with teachers. That distance is influenced by the extent to which learning is predetermined by the structure of a course. Transactional distance is perceived to be greatest when teachers and students do not communicate and when teaching is pre-planned to the extent that individual needs cannot be taken into account (Peters, 2007). The greater the distance the more learners are required to exercise autonomy (Moore, 2007). While Moore's theory is acknowledged to recognise limitations in the structure of independent

learning packages (Garrison, 2000), it is also clear that it was based on assumptions about autonomy and control and a teacher-centred approach to learning.

2.2.3 Recognition of the need for further research and a theoretical framework

Despite its long history, distance education had seldom been the object of scientific research or scholarly work prior to 1965 (Peters, 1994). The view at that time was that the range of conventional educational terminology was not sufficiently comprehensive to explain the phenomena of distance education. Preliminary research questions tended to be grounded in the assumption that instruction referred to an activity that occurred in a classroom setting and concern was expressed that the application of traditional terms to the field of distance education would restrict thinking about teaching and learning beyond conventional concepts (Peters, 1967).

Moore (2007) was of the view that, if teaching and learning practice continued to be defined by technology, the questions generated would be stated as studies of technology and how distance education could resemble real teaching in classrooms through that technology. Moore's (2007) concerns were not unfounded considering: Garrison's (2009) assertion that the origins of online learning lie not in distance education but in computer conferencing; that Saba (2000) has noted a tendency for researchers to conduct comparative studies between face-to-face and online learning with a view to measuring students' learning, placing emphasis on technology rather than on the educational rationale; and the researcher's own intention when designing the first offering of the online course, which was "to provide the cohort of off-campus students with an interactive learning experience that would reflect the educational experience of on-campus students" (refer to Chapter 1).

Moore (1973) argued that there was a need to direct resources towards, “...describing and defining the field...discriminating between the various components of this field; identifying the critical elements of the various forms of learning and teaching, in short, building a theoretical framework which will embrace this whole area of education” (p. 662). Thus, while distance education was recognised as a field in its own right, those responsible for that acknowledged the limitations of their knowledge and the need for a comprehensive theory and framework to guide research and educational practice.

The following sections examine literature relevant to the design and implementation of an online course; the focus of the review revolves around knowledge construction, learner interaction, asynchronous and synchronous communication and collaborative learning.

2.3 Knowledge construction

Charmaz (2006) points out that, “Every way of knowing rests on a theory of how people develop knowledge” (p. 4). This view can equally apply to both research and educational practice. While it is not the researcher’s intent to belabour the significance of underlying assumptions, the very use of the term “knowledge construction” and the phrasing of the research questions within this study denote a constructivist perspective about knowledge and knowing. Although the origin of the researcher’s assumptions are not known, upon recognition it became apparent that the online course had been designed based on a constructivist perspective about learning, that the support and responses of the co-ordinator, during implementation were underpinned by constructivist beliefs and that, as a researcher, the co-ordinator’s knowledge of the case would be constructed from a constructivist stance. Therefore, while it is acknowledged that constructivism is not the only theory which

may be used to interpret knowledge and learning, it was the only one appropriate in this case.

2.3.1 The nature of knowledge

Constructivism is a theory about knowledge and learning as it describes what knowing is and how one comes to know (Fosnot, 2005b). From a constructivist perspective, knowledge is recognised not as truths to be transmitted or discovered, but are instead emergent, developmental, constructed explanations by persons engaged in meaning-making in cultural and social communities (Fosnot, 2005b). Thus learning is considered to be mediated by active involvement and participation in situated social practices (Kumpulainen & Mutanen, 2000). In this case, the cultural and social community constituted students participating in an online educational course and the important social practices within this community were represented by collaborative learning activities.

Constructivist views of learning pervade contemporary educational literature (K. H. Howe & Berv, 2000), represent the dominant learning theory (Karagiorgi & Symeou, 2005) and are frequently associated with online learning (Garrison, 2009; Kilpatrick & Bound, 2003). Current interest in constructivism is considered by some to have been motivated by research into the social dimensions of cognition which has found:

- a relationship between the quality of the interaction between learners and teachers and among learners and the nature of the learning that occurs
- that, by drawing on a larger collective memory and multiple ways of knowing, individuals working together in groups can attain more success than individuals alone

- that language plays a part in promoting learning as explaining one's thinking leads to deeper cognitive processing
- that peer interaction is more facilitative than teacher-learner interactions because of the shared perspectives and experiences of other learners
- that thought, learning and knowledge are not influenced by social factors but are themselves social processes (Palinsar, 1998)

Others are of the view that constructivism has become popular, specifically within online learning contexts, because communication technologies have the capacity to provide an interactive environment that can support instructional methods required to facilitate constructivist approaches to learning and teaching (Kanuka & Anderson, 1999).

Although the assumptions associated with constructivism have in the past been contested, it is now generally accepted that knowledge is actively constructed (Fosnot, 2005b). When knowledge construction and knowing are related to prior knowledge and experience, learning in a social context has been found particularly beneficial. This is because the diversity in learner knowledge can be utilised during interactions so that the contribution of each member accumulates and provides a large base of resources for knowledge construction within the group (Kumpulainen & Mutanen, 2000).

Wells (1999) views "knowledge" as a linguistic construct that can be convenient for certain ways of talking but he acknowledges that these ways may mislead us to reify knowledge and separate it from the activity of people knowing in particular situations. His contextualised view of knowledge is supported by Buckingham Shum (1999), who suggests that:

Knowledge goes beyond structured data (information) by adding intangible, hard-to-quantify ‘value’. When we speak about knowledge we are talking about creativity, timing, judging relevance and reliability, classifying problems and applying lessons learned. Human knowledge is evolving, multifaceted and embedded in social interaction within communities. Meaning and significance are context-dependent properties, not fixed attributes. (p. 5)

Wells (1999) contends that we do not possess knowledge in a literal sense but that we strategically reconstruct a version of it by using what we can remember to “re-know” in a manner appropriate to a current situation. Thus knowing can be understood as the intentional activity of individuals who, as members of a community, make use of, and produce representations of, knowledge in a collaborative attempt to better understand and transform their shared world. Wells asserts that, “in seeking to understand the nature of knowledge and representation, we should focus our attention on the *activity of knowing* rather than on the artefact that is made or used” (Wells, 1999, p70).

Many studies investigating knowledge construction in online contexts have focused on postgraduate or professional courses or programs, particularly those offered as further education for teachers (Gunawardena, 1995; Hendriks, 2002; Hendriks & Maor, 2004; Kanuka & Anderson, 1998; Schrire, 2002). Although there have been claims of pedagogical benefits, there is a lack of empirical data (Rourke et al., 1999) and little is known about what teaching and learning practices contribute to positive outcomes in online courses (Billings, 2000). Learners in this study were predominantly in their first year and enrolled in an undergraduate program of study. The analyses of this case will therefore contribute to a currently limited body of

knowledge about how undergraduate learners in diverse online contexts construct knowledge as they engage in collaborative learning activities.

2.3.2 The range and dimensions of constructivism

Discussion within the previous section may have implied that there is only one form of constructivism, when in fact there are several versions (Palinesar, 1998) and diverse interpretations (Fosnot, 2005b), which stem from variations in epistemological positions (Kanuka & Anderson, 1999). While Palinesar (1998) suggests that the range of constructivist theories may be viewed along a continuum, with constructivism at one end and radical constructivism at the other, Kanuka and Anderson (1999) differentiate the main forms of constructivism as two different dimensions. The first positions understandings of reality along a continuum ranging from objective at one end to subjective at the other (which reflects Palinesar's continuum); the second considers knowledge as individually or socially constructed.

Confusion often arises because, while many use the same constructivist labels, there are many different labels to describe the same central ideas (Kanuka & Anderson, 1999). For example, Palinesar indicates that constructivism stresses individual constructions of knowledge and is concerned with whether constructions are correct representations, whereas radical constructivism rejects the notion of objective knowledge and is based on the assumption that knowledge develops as one engages in dialogue with others (Palinesar, 1998); yet according to von Glaserfeld (1995) a radical constructivist perspective retains its emphasis on the mental processes of individuals. Moreover, some authors have used the terms "constructivism" and "constructionism" to reflect differences between the internal (individual) and the external (social) processes of knowledge construction (Ackermann, 1995). Consequently, the two dimensional concept described by

Kanuka and Anderson (1999) provides an effective means of differentiating among diverse forms of constructivism.

Although there are differences between each perspective there are also central beliefs common to each position. These are that: new knowledge is built on the foundation of previous learning; learning is an active rather than a passive process; language is an important element in the learning process; and the learning environment should be learner-centred (Kanuka & Anderson, 1999; Palinesar, 1998).

Postmodern perspectives reject the view that the locus of knowledge is in the individual and learning and understanding are regarded as inherently social (Palinesar, 1998). Social constructivism is recognised as the most prevalent form of constructivist epistemology (Kanuka & Anderson, 1999). From this position the focus is upon the interdependence between social and individual processes in the construction of knowledge (Palinesar, 1998) and emphasis is placed on social processes in individual knowledge building. As a result knowledge construction is regarded as both an interpersonal and an intrapersonal process (Kumpulainen & Mutanen, 2000). Cognition is perceived as a collaborative process, thought is internalised discourse and the purpose of enquiry is to examine the transformation of socially shared activities into internalised processes (John-Steiner & Mahn, 1996). Cobb (2005) supports this view by pointing out that the important question is not whether the individual or the group should be given priority, but, rather what is the interplay between them?

Within this study the researcher holds a social constructivist view of learning and utilises Vygotsky's (1978, 1981, 1986, 1987) theory of development as a point of theoretical departure for the investigation. The concept of theoretical sensitivity and Vygotsky's views about development, which form the basis of social

constructivism, are discussed in Chapter 3. Use of the term “constructivism” throughout this dissertation, relates to the assumptions associated with a social constructivist perspective of learning unless otherwise indicated.

Fosnot (2005b) asserts that the implications of constructivism for education have remained controversial owing to theoretical variation and interpretation. Wise and Quealy (2006), on the other hand, are of the view that, “while a social constructivist framework may be ideal for understanding the way people learn, it is at odds not only with the implicit instructional design agenda, but also with current university elearning governance and infrastructure” (p. 899). Each point of view regarding the limitations of constructivism has significant implications for both instructional design and educational practice within distance education and online courses.

Wise and Quealy (2006) question the compatibility of a social constructivist framework within education and refer specifically to the opposing agendas of instructional design and institutions. Their concern relates to what they perceive to be limited formal control over what is being learned or how it should be learned within a constructivist framework. Their argument in some respects, reflects historical beliefs about the form and focus of distance education and anxiety over the move to a learner-centred rather than a teacher-centred approach. It also draws attention to important differences in the roles and responsibilities of educators and learners in contexts designed to facilitate learner interdependence rather than learner dependence.

Figure 2.1, presented earlier, illustrates the theoretical orientations of constructivism and social constructivism, which align with views of distance learning in that it may be independent and/or dialogic. Fosnot (2005a) reminds us that,

although educators talk of constructivist based practice, constructivism is not a theory of teaching. She does, however, acknowledge that “a constructivist view of learning suggests an approach to teaching that gives learners the opportunity for concrete, contextually meaningful experience through which they can search for patterns; raise questions; and model, interpret, and defend their strategies and ideas” (Fosnot, 2005b, p. ix). Although the theory of constructivism is open to interpretation, the approach to learning that is described may be accommodated within both a constructivist and social constructivist framework.

Discussion of the concerns and practical implications of a constructivist theory of learning is relevant as there is limited evidence of constructivist pedagogies being implemented in online learning contexts (Kilpatrick & Bound, 2003). Although Simon (1995) previously argued a need for models of teaching based on a constructivist approach, Kirkpatrick and Bound (2002) attribute the deficits they found to course designs which reflected the pedagogical philosophies, resourcing and quality control policies of educational institutions. Their view provides a basis of support for the earlier assertions of Wise and Quealy (2006). Although these researchers emphasise institutional restraints, it could also be argued that course design is significantly influenced by the philosophy and ability of the educator designing the course. While this assertion has support within educational literature (Bullen, 1998; Chou, 2002; Gold, 2001; Hiltz, Coppola, Rotter, Turoff, & Benbunan-Fich, 1999; Woo, Herrington, Agostinho, & Reeves, 2007), it also constitutes a personal opinion, as the teaching and learning strategies implemented within the online course in this study were designed by the course co-ordinator, based on a constructivist philosophy and are believed to reflect a social constructivist approach to learning and teaching (the strategies referred to here are described in Chapter 4).

Regardless of whether the institution and/or the educator are perceived as a constraint, the gap between theory and practice is apparent, as the prevailing philosophy of learning is not clearly evident in the teaching and learning strategies of contemporary practice.

Wise and Quealy (2006) maintain that, if research is to guide the use of technology to enhance learning and teaching, it is important to have firmly grounded and plausible theoretical models and a clear articulation of desired outcomes from teaching practice. Although constructivist theories are frequently utilised as conceptual frameworks in the analyses of computer-mediated discussions and knowledge construction in online learning environments (Hendriks, 2002; Schrire, 2002; Veldhuis-Diermanse, 2002), the relationship between social constructivism and online communication is tentative and not fully supported by previous research (Hendriks & Maor, 2004). Indeed, Wise and Quealy (2006) are critical of the conceptual conjoining of social constructivism and online learning and are of the view that there is currently no connection between constructivist theory and practice in the paradigm of applied research.

This study offers an opportunity to contribute to theoretical knowledge in several respects as the course design reflects the teaching and learning strategies associated with a constructivist perspective of learning; the premise on which the research is undertaken is constructivist and Vygotsky's theory of development is identified as a point of theoretical departure (refer to Chapter 3); the analyses examine the perceptions and processes of both individuals and groups as they engage in collaborative learning activities and, from the findings, connections may be made within and between constructivist theory and educational practice.

2.4 Learner interaction

Interaction has long been considered a defining and critical component of the educational process (Anderson, 2003). Research has shown that interaction among learners makes a positive contribution to student learning and is a significant component of successful online learning (Su et al., 2005). However, it is also acknowledged that the term “interaction” is used in many ways to describe different types of exchanges (Anderson, 2004; Moore, 1989), to the extent that it is almost useless unless specific sub-meanings can be defined (Moore, 1989). This section identifies and describes diverse types of educational interaction, and discusses the challenges presented by the absence of definitional consensus and the implications for teaching and learning practice.

2.4.1 Types of interaction

Anderson (2008b) identifies six different types of educational interaction, which are based on, and constitute an extension of, the work of Moore (1989). Moore (1989) distinguished three types of learner interaction: learner-content, learner-teacher and learner-learner interaction. This range was increased by Anderson and Garrison (1998) to include teacher-teacher, teacher-content and content-content interaction. Although Anderson’s (2008b) list is comprehensive, it does not include learner-interface as an interaction, which was identified by Hillman, Willis and Gunawardena (1994), when they acknowledged that learners must interact with the technological medium in order to interact with the content, instructor or other learners in online environments. A detailed description of these forms of interaction may be found within the aforementioned literature. The intention here is to offer a brief overview to facilitate the connection of particular types of interaction to a

constructivist framework of learning and to specify the types of interaction which constitute the focus of this investigation.

Learner-content interaction is recognised as a defining characteristic of education (Anderson, 2008b; Moore, 1989). Moore (1989) considered the process to involve learners interacting, intellectually, with content in way a that results in a change in the learner's understanding. Learner-content interaction is perceived as an internal or intrapersonal process, one which may involve learners talking to themselves. Although this form of interaction is traditionally associated with texts and other forms of print material, the Internet provides access to a wide range of new opportunities for learner-content interaction (Anderson, 2008b).

Learner-teacher interaction continues to be regarded as essential by some educators and desirable by many learners. Based on the previous discussion, this may be because this form of interaction emphasises the roles and responsibilities of the educator rather than those of the learner as they design or are given a curriculum; seek to stimulate, motivate, enhance and maintain learner interest; make presentations; organise the application of learning, the practice of skills and the manipulation of information and ideas; and evaluate, encourage, support and counsel individuals. The nature and extent of the educator's feedback will be determined by the level of the learners and the personality and philosophy of the educator (Moore, 1989). Within online contexts, learner-teacher interaction is supported by a diverse range of formats that enable educators to adopt a less dominant role in the learning process (Anderson, 2008b).

Learner-learner interaction was originally identified as a new dimension of interaction and one expected to challenge educational thinking and practice. Learner-learner interaction, as the name suggests, relates to communication between learners

either individually or in a group, with or without an instructor (Moore, 1989). Anderson (2008b) points out that learner-learner interaction has traditionally been downplayed as a requirement of distance education, due, initially to limited availability of communication technology and a bias towards individualised learning. However, today modern constructivist and connectivist theorists stress the value of peer-to-peer interaction and multiple perspectives (Anderson, 2008b).

Teacher-content interaction focuses on the creation of content and associated learning activities and the teacher's ability to monitor, construct, and update course content resources and activities. Teacher-teacher interaction creates an opportunity to sustain educators with support and professional development. Content-content interaction is described as the new and developing mode of educational interaction wherein content is programmed to interact with other automated information sources to constantly refresh itself and acquire new capabilities, through updates and interaction with other content sources (Anderson, 2008b). In this respect, it is a form of interaction accessible through the fifth generation model of distance education.

Although each type of interaction serves an important educational function, when viewed from a learner's perspective, learner interaction is considered most significant, particularly if a learner-centred approach, within a social constructivist framework, has been adopted. Within this study, the research questions denote an interest in how learners interact within large and small groups when they communicate asynchronously and synchronously within an online course. The focus of the analyses in this investigation is learner-learner interaction and incorporates to a lesser extent an examination of learner-content interaction. Learner-interface interaction, which was identified by Hillman et al. (1994), is in this case discussed in the context of mediated, or textual communication.

2.4.2 Challenges associated with the absence of definitional consensus

It is difficult to find a clear and precise definition of interaction within educational literature (Anderson, 2008b; Sims, 1999) and despite the fact that a number of studies have examined the concept of interaction, there is a lack of definitional consensus (Beuchot & Bullen, 2005). As indicated earlier, part of the problem is that the term is used in diverse ways and has multiple meanings. The situation is, arguably, exacerbated by diverse types of educational interaction, which in themselves denote different forms of interaction. For example, Figure 2.1 differentiates active and interactive interaction occurring between the learner and content, which in the illustration is represented by textual communication, from participation and transactive interaction occurring between the learner and other learners. This understanding is drawn from a review of the literature and is, in some respects explained by Bates (1990), who distinguishes between interaction as an individual, isolated activity and interaction as a social activity: he asserts that both types of interaction are necessary for learning (and that both require examination). Similarly, Moore (1994) indicates that learner autonomy should coexist with interdependence in a distance learning context and Sims (1999) suggests that, in online contexts, interaction or interactivity can be described in terms of different dimensions which include control, adaptation and communication.

Within educational literature the term “interaction” is often used interchangeably with interactivity (Anderson, 2008b). Su et al. (2005) differentiate between the two, suggesting that interaction is process orientated and focused on dynamic actions, while interactivity is feature orientated and emphasises system characteristics. Berge (1999) on the other hand describes interaction as a two-way communication between two or more people within a learning context, with the

purpose of either task instructional completion or social relationship building. Beuchot and Bullen (2005) categorise interaction further by identifying it as active, reactive or interactive. Interaction is considered active when it does not relate to other messages, reactive when it refers implicitly or explicitly to a previously posted message and interactive when there is a thread or chain of related messages.

Within this study, interaction is recognised as both an individual and a social activity. Learners are perceived to engage in individual interaction when they engage with content (learner-content interaction). Social interaction is associated with two-way communication between two or more people within a learning context, with the purpose of either task instructional completion or social relationship building (learner-learner interaction). Learners participate in a collaborative activity and learner-learner interaction is valued as through it learners have access to a range of resources and are exposed to multiple perspectives.

2.5 Textual communication

Interactions in online contexts tend to be unusually complex because of the need to mediate activity in a text-based environment (Gunawardena et al., 2001). Halliday and Hasan (1985) consider text a semantic unit and view the process aspect of text as an interactive event and a social exchange of meaning. Thus, within online contexts, text assumes the fundamental form of an exchange, representing the dialogue and interaction between speakers. Text then is language that is functional within a particular context. The authors assert that a description and interpretation of the context will enable the researcher to make predictions about meanings of a kind that will help to explain how people interact and that, if the context and the text are treated as semiotic phenomena, researchers can get from one to the other in a revealing way (Halliday & Hasan, 1985).

2.5.1 Online learning contexts

The theory of transactional distance, which was presented as a theory of the pedagogy of distance education, showed that teaching and learning in separate locations are better understood as a significantly different pedagogical domain rather than a deviation from classroom instruction (Moore, 2007). Peters (1967) had earlier concluded that distance education was novel in several respects, specifically: in the form in which it presented, the globalised way it was spreading and the contribution it was making to the discovery of educational opportunities provided by modern communication media. Therefore educators have long been aware of the unique characteristics of distance learning.

Current views of online learning contexts describe an educational domain unique in its potential for interaction, participation and collaboration (Kumpulainen & Mutanen, 2000). These contexts are acknowledged to create a distinctive social climate that has an impact on interactions and group dynamics (Garrison, Anderson, & Archer, 2000; Gunawardena et al., 2001). Research supports the view that learners and educators do not interact in the same way in online learning contexts as they do in face-to-face environments (Rossi & Hinton, 2005; J. C. Taylor, 2001) and that learners do not always conform to the expectations of educators facilitating learning within online courses (Curtis & Lawson, 2001). Even so, Baym (1995) has cautioned that it is erroneous to view patterns in computer-mediated conferencing as direct effects of the medium and maintains that there are at least five different sources of impact; these include: external contexts; temporal structure; system infrastructure; group purposes; and participant characteristics.

2.5.2 Asynchronous and synchronous communication

The online course within this study was computer-mediated. Computer-mediated communications are defined as communications, mediated by interconnected computers, between individuals or groups separated in space and/or time and common characteristics include: asynchronous and synchronous communication capacity, high interactivity, and multi-way (mass) communication (Luppicini, 2007). As a fourth generation model of distance education, the online course was delivered via the Internet and offered access to both asynchronous and synchronous communication, which was utilised by individuals and learners in differently sized groups. Asynchronous communication can occur at any time and at irregular intervals. By contrast synchronous communication occurs in real-time and depends on users being online at the same time (Berge, 1999; Palloff & Pratt, 1999). Consequently, asynchronous and synchronous communication provides learners with access to different learning experiences.

One of the major challenges facing educators today is the engagement of students in active learning environments (Kofoed, 2004) and although online learning contexts support interactive teaching and learning (Leasure et al., 2000), student contributions via electronic posts often lack interactive characteristics (Davis & Rouzie, 2002). While some educators are of the view that this is due to the nature of the online learning environment (Gunawardena et al., 2001), others maintain that two-way interaction is not an inherent part of communication technology and that interaction and learning may not occur if the social structure of the course permits passive compliance (Chou, 2002). Moreover, if interaction is too interactive it may have a detrimental effect by overwhelming the capabilities of some learners (Levin, 2005). Consequently, the results of interaction are not only determined by the context

but are also tied to the instructional design of the course (Chou, 2002). Chou (2002) asserts that carefully constructed courses are essential when attempting to foster relationships among learner, content and technology. This view is supported by Hiltz et al. (1999), who acknowledge that pedagogy has a direct impact on the results of learning and that the effectiveness of a course cannot be separated from the theoretical grounding of its instructional design.

Research by Bullen (1998) suggests that a dynamic, interactive, educational process that facilitates critical thinking is contingent on several factors, which include an appropriate course design, the interventions of the instructor, and content and student characteristics. Chang (2002) also found that asynchronous online learning can promote critical thinking, with the support of constructivist instructional design, cooperative/collaborative learning, critical reflective learning strategies and the opportunity to engage multiple perspectives. Garrison (1997), however, draws attention to the fact that “The reflective and explicit nature of the written word is a disciplined and rigorous form of thinking and communicating [I]t allows time for reflection and, thereby, facilitates learners making connections amongst ideas and constructing coherent knowledge structures” (p. 5). Thus textual communication, which is a context specific aspect of online courses, may simultaneously challenge learners and promote learning. The point is that, both context and design have a significant impact on the process and outcome of learning in contemporary distance education.

Chou (2002) and Schrire (2006) draw attention to the predominant use of asynchronous communication, within educational contexts, which is attributed to difficulties associated with coordinating synchronous meetings, costs and the quality of the technology supporting synchronous communication. The focus on

asynchronous communication within educational practice has had an impact on online research as the majority of studies have examined learner interaction within asynchronous networks. Few studies have examined interaction in synchronous networks and fewer have investigated interaction in both synchronous and asynchronous networks (Chou, 2002). This study analyses the interactions among learners who use both asynchronous and synchronous communication to complete collaborative learning activities.

Although the main focus in the creation of online courses has been on technological issues (Swan et al., 2000), social and pedagogical aspects are considered to play a far bigger role in the creation of a successful online learning environment (Mason, 1994). Indeed, J. C. Taylor (2001) asserts that asynchronous and synchronous communication is not just another technology as “its capacity to re-humanize distance education represents a qualitative shift which has the potential not only to reshape learning at a distance, but also to pervade conventional educational systems” (p. 6). These points are supported by research which suggests that although online interactions may be low in social context cues, computer conferencing can be perceived as active, interactive, interesting and stimulating by conference participants (Gunawardena, 1995). Such discrepancies have led to a call for studies to explore online learning from the student’s perspective (Bullen, 1998).

The nature of the interactions between learners in online contexts have been found to impact upon learner perceptions of the learning medium (Gunawardena, 1995) and perceptions of learning contexts have been found to impact upon approaches to learning (Meyer & Muller, 1990). The perceived presence of others in learning groups has also been associated with a reduction in participants’ perceptions of isolation, promoting a sense of community and enabling participants to articulate

their thoughts and reasoning as part of the learning process (Kanuka, 2002; Richardson, 2003; Rourke et al., 1999; Rovai, 2002). Gundawardena et al. (1997) point out that participant reports of learning or satisfaction with the learning experience are important and may be found in the transcripts of computer conferences. This study examines how learners conceptualise interaction and knowledge construction within the online course and explores how these perceptions shape communication and learning within online groups.

2.6 Collaborative learning

From a social constructivist perspective, learning is recognised as the appropriation of socially derived forms of knowledge that are internalised over time and transformed in idiosyncratic ways during the appropriation process (John-Steiner & Mahn, 1996). The process involves interpretation as learners relate new information to pre-existing knowledge and personal experience (Kumpulainen & Mutanen, 2000). The use of language among learners becomes a social mode of thinking where students learn by engaging in dialogue (van Boxtel, 2000) and during the process, the thinking of individuals is influenced by the group in which they are working (Schrire, 2002). Thus from a constructivist standpoint learning implies interaction with others (Strijbos et al., 2004).

Within educational literature, collaboration may be considered a special form of interaction or a process of participation in collaborative activities (Lipponen, 2002). It is generally accepted that linguistic and conceptual artefacts play an important role in the construction of knowledge (Stahl, 2006); therefore to understand phenomena related to collaborative learning it is necessary to examine the ways in which learners interact with one another (Stahl & Hesse, 2006). The challenge within a social constructivist framework is to provide an adequate

description of the interaction and how knowledge is co-constructed through inter-subjective relations while doing justice to the individual's perspective and prior experience (Confrey, 1995).

Group-based learning has become an important aspect of contemporary education (Strijbos et al., 2004) and is evident in online environments through student-centred learning activities, collaborative working modes, authentic learning contexts and technological innovations which offer learners opportunities to participate in, observe, reflect on and practise socially shared ways of knowing and thinking (Kumpulainen & Mutanen, 2000). Yet there is concern that the design of collaborative settings has, for the most part been based on subjective decisions about tasks, pedagogy and technology (Strijbos et al., 2004), to the neglect of the possibilities provided by the material world for facilitating mutual understanding and shared goals (Lipponen, 2002).

Researchers are becoming increasingly aware of the importance of understanding how meanings and knowledge are constructed by learners while they work in small groups on various learning activities (Kumpulainen & Mutanen, 2000). Although the issue of how learners interact within collaborative learning groups is receiving increasing attention, the impact of interaction on learning tends to be explained in retrospect (Strijbos et al., 2004). Moreover, while the outcome of collaborative learning is acknowledged to be mediated by the quality of group processes, research has tended to focus on the quality of collaborative products or on individual results, which has led to considerable uncertainty about the relationship between collaborative interaction and learning outcomes (Strijbos et al., 2004).

There is recognition that, in order to understand collaborative learning, we must analyse collaborative activities on both macro and micro levels (Lipponen,

2002) and there is interest in the analyses of the interactions of individuals as learning entities and between learners in groups as separate learning entities (Lally & De Laat, 2002). A multi-level approach of this kind would appear to offer a means of addressing the concerns expressed by Confrey (1995) about representing both individual and social perspectives of learning. This study examined the processes of learner-learner interaction and knowledge construction as individuals collaborated in groups of different sizes to complete learning activities. An SNA facilitated a macro level analysis of the interactions that facilitated knowledge construction within the online course, while constant comparative method facilitated micro level analyses of the processes of interaction and knowledge construction, within synchronous and asynchronous discussions.

2.6.1 Models for the analyses of learner interaction and knowledge construction

In both theory and practice there is ongoing concern with the collaborative and transformative way in which knowledge is co-constructed (John-Steiner & Mahn, 1996; Tillema & van der Westhuizen, 2006). It has been argued that a systematic enquiry of educational interactions can yield understandings and insights about the relationship between teaching and learning (Lally & De Laat, 2002). Educational literature suggests that knowledge construction is inherent in the structure of conversations and debates (Schrire, 2002) and that a detailed examination of online transcripts can provide theoretical and practical insights about online contexts and the processes and the outcomes of knowledge construction (Gunawardena et al., 1997). Although various researchers have examined interaction and knowledge construction in online contexts, by examining and coding online transcripts (Anderson, Rourke, Garrison, & Archer, 2001; Gunawardena et al., 1997;

Henri, 1992; Lally & De Laat, 2002; McLoughlin & Luca, 1999; Merrill, DiSivestro, & Young, 2003; Swan, 2002; Veerman & Veldhuis-Diermanse, 2001; Veldhuis-Diermanse, 2002) previous research has failed to show how interaction is used to create knowledge and understanding (Hendriks, 2002). The difficulties associated with gaining insight into the processes of knowledge construction are acknowledged and compounded by the fact that no single theory, definition or instrument can satisfactorily reflect the complexity of cognition (Schrire, 2006). The consequence of this is that researchers are still developing methods consistent with a social constructivist perspective of learning.

Several theoretical frameworks and analytical models have been developed to promote understanding of the learning process (Henri, 1992), examine the social construction of knowledge in computer conferencing (Gunawardena et al., 1997), guide interventions and support learning (Henri, 1992), offer conceptual order and promote optimal use of the online medium (Garrison et al., 2000). Progress has in itself been a demonstration of how knowledge may be co-constructed, given that researchers have examined and identified the strengths and limitations of previous efforts and then built upon the work of others to advance knowledge and understanding of the phenomenon, which in this case is online learning.

The seminal work by Henri (1992) produced a framework intended to help distance educators understand the learning process and facilitate interaction for collaborative learning. Initial concern had been with the lack of knowledge of the pedagogical characteristics of online discussions, how learning occurred in online contexts and which elements led to learning. The model that was developed was comprehensive and emphasised participation, interaction, social, cognitive and metacognitive as five dimensions of the learning process, which were identifiable in

contributions to online discussions and pertinent to distance learners, and a cognitive approach to the learning process. Henri's (1992) work has been cited extensively by researchers who have examined learning in online environments (Anderson et al., 2001; Hara, Bonk, & Angeli, 2000; Lally & De Laat, 2002; McLoughlin & Luca, 1999) yet the model has also been criticised because it adopts a teacher-centred approach to learning and is non-specific about how to evaluate the processes of knowledge construction that occur through social negotiation (Gunawardena et al., 1997).

Gunawardena et al. (1997) observed that the assessment and evaluation of computer conferencing often involved the analyses of patterns of participation and participant satisfaction; reinforcing the view that attention has in the past focused on technology rather than pedagogy. While the analysis of participation was recognised as valuable when determining who participated how actively and for how long, neither quantitative analysis nor participant reports were able to offer insight into the quality of learning that takes place. This group of researchers wanted to know whether learners constructed knowledge in a group through computer-mediated exchanges and whether participants changed or constructed new understandings based on their interactions within the group.

In contrast to Henri's (1992) study, the online context was identified as a constructivist learning environment. In order to meet the needs of their investigation, the researchers utilised elements of Henri's model as a starting point in the analysis of the content of an online debate and in their study they excluded the participation and social dimensions and focused instead on the interactive, cognitive and metacognitive aspects of the model (Gunawardena et al., 1997). Using grounded theory principles, Gunawardena et al. (1997) determined five phases of knowledge

co-construction, which were sharing/comparing, dissonance, negotiation/co-construction, testing tentative constructions, and statement/application of newly-constructed knowledge. Each phase was found to involve specific operations which may occur at each stage of the process. The process and the outcomes of knowledge co-construction were described in the following way by Gunawardena et al. (1997):

“Interaction” is the process by which all the pieces are put together as the learning experience proceeds. The co-constructed knowledge then becomes the pattern which can be viewed in looking at the interaction as a whole. This knowledge, or pattern, exists regardless of how much or how little of it is assimilated by the individual participants. At the end, each participant is likely to take away his or her own construction, the pattern of which reflects in greater or lesser detail the pattern established in the whole. (pp. 415-416)

The model was used primarily to evaluate professional development conferences. Although interaction was considered the vehicle of knowledge construction (Gunawardena et al., 1997), the nature of neither learner interaction nor learner participation was analysed. The focus of this model on was the co-construction of knowledge as assumptions were drawn about the outcomes of the process for individuals who engaged in the collaborative learning experience.

The work of Garrison et al. (2000) presents a community of inquiry model as a conceptual framework and a practical inquiry model as an analytical tool which may be used to analyse computer conference transcripts. Together these models represent a means to assess the nature and quality of critical discourse and thinking in a text based educational context (Garrison, Anderson, & Archer, 2001) and a

guide, for educators, to facilitate optimal use of the online medium for knowledge construction (Garrison et al., 2000).

The community of inquiry model identifies three elements considered crucial for a higher education experience: cognitive presence, social presence and teaching presence. In this regard associations can be made between this model and the three types of learner interaction originally distinguished by Moore (1989) and the cognitive and interactive aspects of the models of Henri (1992) and Gunawardena et al. (1997). Although the model represents three different elements of an educational transaction, emphasis has been placed, by its creators, on teacher presence because, although social and content-related interactions among participants were considered necessary, interactions by themselves were not perceived to be sufficient to ensure effective online learning (Garrison & Arbaugh, 2007). Thus, in this model the role of the teacher would appear to have been given precedence. More recently Garrison and Arbaugh (2007) have acknowledged a need to better understand the interdependence among the three elements.

Within the practical inquiry model, online discussion among learners was found to involve movement which was represented by four different phases: a triggering event, usually initiated by the instructor or moderator; a phase of exploration, leading to awareness of aspects of the issue or problem; a phase of integration, characterised by deliberation and reflection and a phase of resolution, characterised by a commitment to solutions that are tested by a deductive process in the discourse situation. The process is viewed as a spiral as each phase may lead to a new triggering event (Garrison et al., 2000). Interestingly, both this and the previous model describe knowledge construction as a sequential process consisting of various phases; however, the practical inquiry model depicts a progressive ongoing process.

Although only three models are described here, each one is recognised to have made an important contribution to current understandings of computer-mediated interaction and knowledge construction. Moreover, these particular examples appear to have moved progressively, in both theory and analytical approach, towards the concept of a community of learning or learning community, arguably shaping the way we currently view online learning and online contexts. Indeed, Garrison et al. (2000) contend that “computer conferencing has considerable potential to create a community of inquiry for educational purposes” (p. 1).

Yet the notion of a learning community is another area which lacks definitional and conceptual consensus. Definitional themes suggest that a learning community may be described as a group of individuals who share a common purpose or goal, collaborate to address learning needs and draw from individual and shared experiences in order to construct knowledge and enhance the individual and collective potential of community members (Rovai, 2002). From this description, an interactive online course may be considered a learning community. However, Downes (2004) is of the view that:

Probably the greatest misapplication of online community lies in the idea that it is an adjunct to, or following from, the creation and design of an online course....[T]he relation ought to be the other way around: that the course content (much less its organization and structure) ought to be subservient to the discussion, that the community is the primary unit of learning, and that the instruction and the learning resources are secondary, arising out of, and only because of, the community. (p. 1)

Given that, among other things, learning communities are considered to reduce student perceptions of isolation, the community concept could be viewed as a social constructivist means of reducing transactional distance, not only between learners and teachers but also between learners and other learners.

2.6.2 Reiteration of the need for an integrative theory

Although Garrison (2000) contends that the theory of distance education needs to catch up with recent developments in the practice of distance education, the literature reviewed would suggest that no theory thus far has adequately integrated the diverse components of distance education, explained the essential elements of distance learning or fully explored potential applications and limitations of technology in teaching and learning practice. Garrison and Archer (2007) lend support for this assertion as in a recent discussion they emphasised that the challenge facing researchers and teachers in distance education today is the development of a more sophisticated understanding of the characteristics of new technology and the ways that technology may be used to enhance critical thinking and higher-order learning. The authors drew attention to the absence of empirical research about how to facilitate critical thinking in distance education generally and online contexts specifically and asserted that the situation was compounded by technology and communication whose characteristics had not been well researched.

Garrison (2000) has acknowledged that “The ultimate theoretical challenge of any field of practice is to achieve a synthesis of perspectives and theories (i.e. global theory) that reflects the complete continuum and is inclusive of a full range of practices” (p. 12). Garrison’s (2000) view reiterates Moore’s (1973) perceptions which were voiced at a time when distance education was becoming established, yet surprisingly Garrison indicated that it was his belief that this goal was not a realistic

expectation for distance education in the short term. The need to synthesise theoretical perspectives is acknowledged by Anderson (2008b), who is currently working towards a theory of online learning. Although this review has identified online learning as one component of distance education, the preliminary model developed by Anderson may provide a theoretically informed basis from which to coordinate and extend knowledge and understanding of distance education, online learning and teaching and learning practice from a social constructivist perspective.

Figure 2.2 illustrates the main elements of the model, each of which can be related to, and represents, a synthesis of discussion within this chapter. The diagram shows two sets of actors, students and teachers and that interaction among actors and between actors and content occurs through asynchronous and synchronous communication. Six types of interaction are recognised: student-content, student-student, student-teacher, teacher-teacher, teacher-content and content-content interaction. These are derived from the work of Moore (1989) and supplemented by the work of Anderson and Garrison (Anderson, 2008b). Two models of learning are represented: collaborative and independent learning. Collaborative learning may take the form of collaborative communities of inquiry or communities of learning which are reflected on the left of the diagram. Independent learning is depicted on the right, together with a range of structured learning resources (Anderson, 2008b). In this respect, the model depicts both constructivist and social constructivist perspectives, or alternatively independent and dialogic approaches to learning. Arguably, the single aspect of the model that may require adaptation to provide a fully integrative tool with which to view, plan, design, implement and evaluate distance education is the form of communication used to connect both actors and content. This is primarily

because it has been shown that advances in technological forms of communication consistently outpace the development of theory and teaching and learning practice.

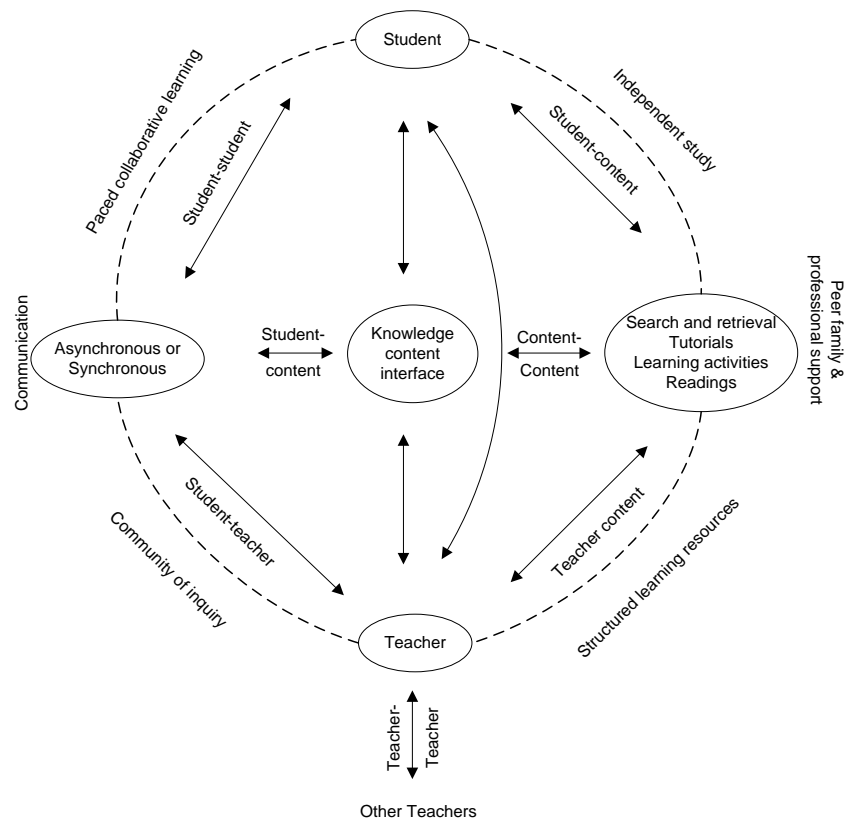


Figure 2.2 Towards a model of online learning (Anderson, 2008b, p. 61)

2.7 Summary of the chapter

The aim of this chapter was to offer an integrated review of educational literature which located and clarified the research problem, summarise broadly accumulated knowledge about the phenomena of interest within the investigation, highlight important issues that research has left unresolved and initiate a conversation about theoretical concerns within the field of distance education. The review positions the research problem within the field of distance education generally and online learning specifically and focuses on four particular areas: knowledge construction, learner interaction, asynchronous and synchronous communication, and collaborative learning. The evolution of distance education and the implications of historical models and assumptions for both research and practice

were discussed. Distance education was acknowledged as a complex, diverse and rapidly evolving field which has moved to the forefront of educational practice due to unprecedented developments in technology and communication. The course, which constitutes a case within this study, was described as a fourth generation model of distance education, as it was delivered online via the Internet and offered access to both synchronous and asynchronous communication.

Literature pertinent to the design and implementation of distance education courses in online contexts was examined; this included a discussion about the nature of knowledge and the range and dimensions of constructivism. Different types of educational interaction were identified and the challenges associated with multiple meanings and uses of the term “interaction” were examined. Textual communication in online contexts was discussed and related to issues associated with instructional design. Collaborative learning was described as a special kind of interaction or, as in this case, participation in collaborative activity. Discussion included a description of models that have been used in the analyses of interaction and knowledge construction within online contexts. The conversation draws attention to a move towards learning communities as a potential means of addressing transactional distance within a social constructivist framework of learning and reiterates the need for an integrative theory to advance both research and practice within distance education. Although not designed for this purpose, Anderson’s (2008b) model of online learning is believed to have some potential in this regard.

The review of educational literature suggests that despite current rhetoric there is limited empirical evidence to support links between computer-mediated communication and social constructivist theories of learning, and previous studies have been unable to explain how interaction is used to create knowledge and

understanding. The focus of previous online research has, for the most part, been levelled at postgraduate or professional courses or programs and, as a result, little attention has been paid to the interaction and knowledge construction processes of learners engaged in undergraduate, online courses. The significance of the context of online environments has been acknowledged within previous studies but few studies have analysed the patterns of learner interaction of students engaged in group activity within both synchronous and asynchronous environments.

CHAPTER 3

THEORETICAL FRAMEWORK

3.1 Introduction

This chapter has strong links with Chapter 1, which provided an overview of the research problem, outlined the researcher's interest in, and motivation for, the study and delineated the purpose, context and scope of the investigation. Of particular relevance to this discussion is the researcher's account of her developing philosophy of education and assumptions about learning and instruction, which were recognised to have implications for the design of the course and potential implications for the analyses of data from the case.

The literature review, presented in Chapter 2, explored knowledge and understandings of learner interaction and knowledge construction in online contexts, in order to clarify the research problem and to identify potential limitations of, or deficits in, empirical knowledge about the phenomena of interest in this investigation. The review positioned the research problem within the field of distance education generally, and online learning specifically, and focused on four particular areas: knowledge construction, learner interaction, textual communication (in the form of asynchronous and synchronous communication) and collaborative learning. Educational literature in these areas revealed the prevalence of constructivist perspectives in relation to learning and teaching practice and the use of constructivist frameworks in online research.

This chapter clarifies the purpose of the theoretical framework within this study, identifies and describes the key constructs of Vygotsky's genetic theory of learning and development, and explains the potential relevance of these concepts to this investigation.

3.2 Theoretical sensitivity

Although theoretical frameworks are common in quantitative research, controversy exists about whether, and how, these frameworks may be used in qualitative studies (Corbin & Strauss, 2008). Theoretical frameworks are acknowledged to consist of a system of concepts, assumptions, expectations and beliefs that support and inform the research process (Maxwell, 2005). As such they offer a guide that may be used to select concepts for investigation, research questions and to frame research findings (Corbin & Strauss, 2008). The imposition of a conceptual framework is, however, considered a considerable threat to validity in interpretive research (Robson, 2002) and as a result there is a reluctance to commit to a theoretical framework at the outset of a qualitative study (Gibbs, 2002). Even so, it is acknowledged that qualitative researchers draw to some degree upon existing theories (Gibbs, 2002; Robson, 2002; Strauss & Corbin, 1994), carrying possibilities into their research from reading, training and experience (Corbin & Strauss, 1990). Thus in qualitative studies theories are regarded as signposts or sensitising concepts and considered useful if they are examined in conjunction with theories that emerge from the data (Corbin & Strauss, 1990; Glaser, 1978). Utilised in this way there is an opportunity to develop sensitising concepts as the study progresses (Gibbs, 2002).

The potential to appropriate theoretical frameworks for use in inductive, qualitative studies is clarified, *albeit* unintentionally, by Garrison (2000), who describes three important elements of a theory: the framework, a model and constructs. As the author explains:

A theoretical framework represents a broad paradigmatic set of assumptions that provides the elements of the theory but without the detail and completeness (nuances) of a comprehensive theory. A model is a less abstract

form of a theory and represents structural relationships among the key concepts. It is a replica and often provides visual simplicity that can be grasped at a glance. However, by itself, it may lack the richness of explanation inherent in a theory. Finally, concepts are the building blocks of a theory and evolve from ideas generated from direct experience. In this way they are less abstract and do not have the coherence of a framework, model or theory. (pp. 3-4)

Thus, in a qualitative study a theoretical framework may provide an outline which, metaphorically speaking, may be coloured or developed by concepts which emerge during data analyses. A model, on the other hand, offers a visual representation of the relationships between theoretical constructs. When combined these three elements constitute a comprehensive theory.

Theories serve several functions, may inform practice (Garrison, 2000) and enable researchers to demonstrate links between their field of interest and those of other researchers (Anderson, 2008b; May, 2001). Indeed, when constructing grounded theory, conceptual frameworks may be used to explain conceptual logic, locate specific arguments, engage leading ideas, position a new theory in relation to extant theories and explain the significance of the concepts constructed (Charmaz, 2006). It is therefore important that researchers give due consideration to the approach of theorists to questions that concern them (May, 2001).

In this study, the phenomena of interest were the processes of, and the relationship between, learner-learner interaction and knowledge construction in groups of different sizes using synchronous and asynchronous communication to complete collaborative learning activities. Given the educational philosophy of the researcher and the purpose and context of this research, theoretical frameworks that

reflected a social constructivist stance were of particular interest. From this perspective, individuals are assumed to construct knowledge by building on their experience, continuously refining their knowledge of the world through interaction, negotiation and collaboration in social and cultural contexts (Kanuka & Anderson, 1998; Palinesar, 1998). Learning and understanding are considered inherently social and the use of tools and activities is believed to be integral to conceptual development (Palinesar, 1998). Given that potential sensitivity may be lost if commitment is made to one preconceived theory (Glaser & Strauss, 1967), Vygotsky's genetic theory of learning and development (Wells, 1999) was identified as a sensitising possibility and point of theoretical departure for this investigation.

The selection of Vygotsky's theory, as a point of departure was deemed to be supported by literature which reported that: the theory had not been fully developed as a result of Vygotsky's premature death from tuberculosis, at the age of 37 (Bruner, 1985); theoretical constructs are represented within associated literature by diverse interpretations, as opposed to a definitive translation of Vygotsky's work which was written in Russian; and Wells (1999), who is a strong proponent, contends that, although we should review Vygotsky's texts and try to understand them, we should also be willing, in appropriating his ideas, to transform them so that they meet the demands of our own situations. It could therefore be argued that Vygotsky's theory may function more effectively as a sensitising concept than an analytic guide.

3.3 Vygotsky's genetic theory of learning and development

Vygotsky is acknowledged as a theorist with a deep appreciation of developmental and environmental forces (Crain, 2005). His ideas were strongly influenced by the work of Karl Marx (1818-1883), who acknowledged that while humans had biological needs, they also had a capacity for tool use and production.

Marx believed that, by producing and using tools, humans were able to master their environments, satisfy their needs and fulfil their deepest creative potential (Crain, 2005); herein lies a link between developmental perspectives of learning and Maslow's theory of motivation, referred to in Chapter 1, together with evidence of Vygotsky's appropriation of Marx's notion of tool use.

Marx also considered production to be an inherently social process and argued that it was a mistake to describe human nature in the abstract and apart from its social-historical context (Crain, 2005). Similarly, Vygotsky argued that it was necessary to study the genesis of behaviour (Wells, 1999) and that in order to understand the individual one must first understand the social relations in which the individual exists (Wertsch, 1985). His view was contrary to contemporary opinion and he is acknowledged as one of few theorists to consider an integrated theory (Crain, 2005). Vygotsky observed that;

Formerly, psychologists tried to derive social behaviour from individual behaviour. They investigated individual responses observed in the laboratory and then studied them in the collective. They studied how the individual's responses change in the collective setting. Posing the question in such a way is, of course, quite legitimate; but genetically speaking, it deals with the second level in behavioural development. The first problem is to show how the individual response emerges from the forms of collective life. (Vygotsky, 1981, pp. 164-165)

In essence, Vygotsky conceptualised development as the transformation of socially shared activities into internalised processes and recognised a complex relationship between history as change and history as universal human progress

(Wertsch, Del Rio, & Alvarez, 1995). The significance of Vygotsky's theory in relation to this study lies in his explanation of the dynamic interdependence between social and individual processes in knowledge construction. Three major themes explain the nature of this relationship in learning contexts; these are: that individual development, including higher mental function, has its origins in social sources; that human action on both a social and an individual level is mediated by tools and signs and that the first two themes are best examined through genetic analysis (John-Steiner & Mahn, 1996; Palinesar, 1998).

Figure 3.1 offers a visual representation of Vygotsky's theory, based on the researcher's understanding of the theoretical constructs and the relationship between them. Within the diagram, historical development is depicted as a time continuum and forms the foundation of the learning community; semiotic mediation is depicted as the interaction that occurs between and among members of the community; and interdependence is represented by the ZPD, which is located in the centre of interaction and at the intersection between individuals and others. The illustration shows that the exchange of knowledge, experience and understanding occurs through interaction within the ZPD between individuals and others within the community.

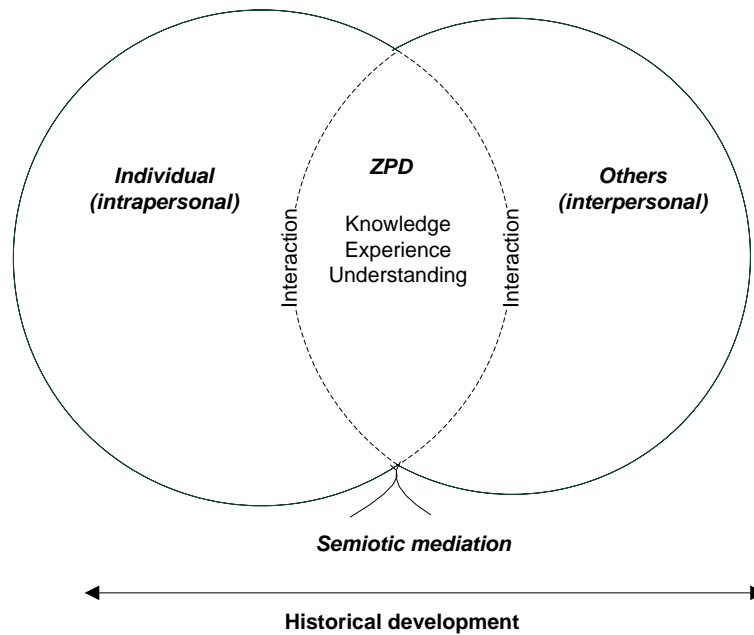


Figure 3.1 Conceptualisation of Vygotsky's theory of development

Reference is made to Figure 3.1 within the following subsections, which describe the principal constructs of Vygotsky's theory which include semiotic mediation, ZPD and genetic analysis.

3.3.1 Semiotic mediation

Vygotsky argued that it was in communication that social understanding was made available for individual understanding (Daniels, 2001). Thus within his theoretical framework the concept of semiotic mediation is central to all aspects of knowledge construction. Wertsch (1994) explains that:

[Mediation] is the key in his approach to understanding how human mental functioning is tied to cultural institutional and historical settings since these settings shape and provide the cultural tools that are mastered by individuals to form this functioning. In this approach the mediation means are what might be termed the "carriers" of sociocultural patterns and knowledge. (p. 204)

Wertsch (1994) highlights the significance of the context of learning and the means individuals use to communicate within it. These means are categorised as semiotic tools which may be either physical or psychological, and examples include language, writing, computers and symbol systems. Physical tools are those directed towards the external world, while psychological tools are directed internally and may be appropriated during activity (John-Steiner & Mahn, 1996). Vygotsky referred to the tools that people use to aid their thinking and behaviour as *signs* and argued that we cannot understand human thinking without examining the signs that cultures provide. The theorist referred to sign use as mediated behaviour and considered speech to be the single most important sign system (Crain, 2005), believing that discourse played a critical role in learning and teaching (Wells, 1999).

As development is assumed to depend on interaction with others communicative exchanges have been given an increased role in examinations of developmental processes (Hogan & Tudge, 1999); indeed, almost all socio-cultural researchers place language in a central position (Wells, 1999). Speech and writing are very much social modes of communicating, even when participants may not be co-present in time and space. Vygotsky was particularly interested in inner speech and its origins in the social speech that accompanied problem-solving activities, of various kinds in face-to face interaction (Wells, 1999). Although speech is acknowledged as a valuable tool in the generation of interesting and novel ideas, it is thought to be an inadequate means of preserving them. Vygotsky made it clear that the means of semiotic mediation were not limited to speech, although his interest in writing was as a psychological tool rather than as an activity in its own right (Wells, 1999). Invoking Vygotsky's theory, Wells (1999) suggests that the primary function of speech can be seen to mediate action, while the primary function of writing is to

mediate recall and reflection. Wells (1999) maintains that, as a mode of meaning-making, writing complements rather than duplicates the roles of speech because of the way it is produced and the permanence of the artefacts that occur as a result of the process.

The potential relevance of the concept of semiotic mediation, in this investigation relates to conditions within the online course which require the use of computer hardware, software and textual interaction in the form of asynchronous and synchronous communication. Although computer-mediated communication is a technological means of communication not considered in Vygotsky's theory, the electronic medium constitutes a dual purpose mechanism with the capacity to function as a physical and a psychological tool. This multipurpose feature may have important implications for student interaction in collaborative learning activities; if this is the case, then semiotic mediation may influence how learners interact within the online course.

Wells (1999) asserts that we can trace the construction of concepts through the gradual evolution of written discourse and suggests that written communication may have greater potential as a mediator of knowledge construction. Thus semiotic mediation may also have implications for how learners construct knowledge within online contexts. Wells (1999) outlines four requirements when making meaning with text, which reflect conditions originally identified by Vygotsky. Firstly, there must be an activity system and associated community within which the writing plays a significant role as for writing to engage the commitment of the writer the resulting text must be functional with respect to joint activity in which the writer is involved with at least some other members. Secondly, it must concern a topic in which the writer is interested and about which he or she believes there is more to discover.

Thirdly, the writer must care sufficiently about the aesthetic quality of the textual artefact that she or he is creating to engage with and find solutions to the problems that arise in the process of its creation. Finally, the writer must also be able to count on the community to give help in accessing textual and other relevant resources and in providing support and guidance as this is felt to be necessary. The first and second conditions are relevant to this case as they reflect aspects of the course design; the third and fourth represent sensitising topics as they extend beyond the scope of the design and could not be predetermined.

Vygotsky believed that the process of development involved the internalisation of social interactions and that as a result there was interdependence between individuals and others. Figure 3.1 connects individuals with others showing interaction as a permeable bond through which knowledge experience and understanding are exchanged. Wells (1999) asserts that internalisation may be considered the end for which interaction was conceived as the means within the ZPD. The relationship among interaction, higher mental functioning and the process of internalisation is clarified by Leont'ev (1981, as cited in Wells, 1999) who explains:

Higher psychological processes unique to humans can only be acquired through interaction with others, that is, through interpsychological processes that only later will begin to be carried out independently by the individual. When this happens, some of these processes lose their initial, external form and are converted into intrapsychological processes. (p. 319)

The question of internalisation is, however, a contested aspect of Vygotsky's theory as while some critics believe the concept lacks explanatory power others consider the

differentiation between internal and external processes to be too distinct (Wells, 1999).

3.3.2 Zone of proximal development

The ZPD has also been extensively critiqued and is one of the most extended constructs from Vygotsky's theory (Wells, 1999). The concept was created as a means of explaining how social and participatory learning takes place (John-Steiner & Mahn, 1996). Vygotsky maintained that:

Learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and with his peers...[L]earning is not development; however, properly organized learning results in mental development and sets in motion a variety of developmental processes that would be impossible apart from learning. Thus learning is a necessary and universal aspect of the process of developing culturally organized, specifically human, psychological functions. (Vygotsky, 1978, p. 80)

Vygotsky's ZPD is believed to have served two functions. The first was to assess individual intellectual abilities through the conceptualisation of intellectual potential, as opposed to measuring IQ. The second was to enable instructors to promote the development of higher mental functions (Wells, 1999). As such, the ZPD "...was outlined as a way of evaluating and educationally fostering development in accordance with his genetic-cultural theory of higher functions" (Del Rio & Alvarez, 2007, p. 276).

The ZPD was defined as "the distance between the actual developmental level as determined by independent problem solving under adult guidance or in

collaboration with more capable peers” (Vygotsky, 1978, p. 86). Vygotsky argued that in order to understand the relationship between learning and development it was necessary to distinguish between two different levels: the actual and the potential. The actual level refers to accomplishments that an individual can demonstrate independently, whereas potential levels are those that can be achieved only with assistance (Palinesar, 1998).

“Vygotsky’s strategy was to examine how mental functions such as memory, attention, perception and thinking first appear in an elementary form and then are changed into a higher form” (Wertsch, 1985, p. 24). Higher mental functions were presumed to represent a qualitatively new level of psychological functioning, characterised by awareness and volition. Four major criteria were identified to distinguish between the two levels; these included: a shift in control from the environment to the individual in voluntary regulation; the emergence of conscious realisation of mental processes; the social origins and the social nature of higher mental functions; and the use of signs to mediate higher mental functions (Wertsch, 1985).

There is, however, some ambiguity surrounding the ZPD (Confrey, 1995) and it is acknowledged that there are deficits in current understandings of Vygotsky’s intentions for the ZPD and how the construct may operate in practice, which may account for the critiques and extensions referred to earlier. For example, it has been assumed that Vygotsky’s theory of learning, teaching and development applies to all ages and stages of development, even although the focus of his research was interactions among children and between adults and children, not between adults. There is also a lack of specificity about the nature of instruction and the roles that students may play in shaping learning activities (Wells, 1999; Wertsch, 1985). Had

Vygotsky's theory been used as a theoretical framework in the traditional sense, rather than as a point of departure within this investigation, these deficits may have had a significant impact on the analyses of data. In this case, the concepts of semiotic mediation, interdependence between individuals and others and the internalisation of social processes appeared more relevant and therefore held more interest in this investigation.

3.3.3 Genetic analysis

As a psychologist, Vygotsky was interested in all forms of human behaviour yet, unlike many of his contemporaries, he did not believe that a descriptive analysis of current behaviour, however detailed, could provide an adequate basis for an explanation of what was observed. Vygotsky argued that it was necessary to study the genesis of behaviour (Wells, 1999) and as a result genetic analysis examines the origins and history of phenomena and focuses on their interconnectedness (John-Steiner & Mahn, 1996).

Vygotsky's theory looks beyond the historical development of individual behaviour and in it he proposes four interrelated domains (Palinesar, 1998), or levels of analysis, which may be utilised to study any form of development (Wells, 1999). Each domain has a different focus and corresponds to the developmental trajectories of a particular event or situation (microgenesis), of an individual (ontogenesis), of a culture (cultural/historical development), and of the human species as a whole (phylogenesis) (Palinesar, 1998; Wells, 1999). Operating on different time scales the more extended developmental domains simultaneously serve as constraints on and resources for, development from the less extended down to the microgenetic events of lived experience (Cole & Engerstrom, 1993). Wells (1999) asserts that despite differences of substance among the four domains the reason for adopting a genetic

approach remains constant; that in any domain the present state can be understood only by studying the stages of development that preceded it. Most of Vygotsky's research was conducted on elementary and higher mental functioning in the ontogenetic domain (Wertsch, 1985) and focused on adult-child interaction (Hogan & Tudge, 1999). By contrast, this investigation may offer developmental insights about the course and learning activities (microgenesis), individual, adult learners (ontogenesis) and learning groups within the case (cultural development). In describing his approach Vygotsky emphasized that:

We need to concentrate not on the product of development, but on the very process by which higher forms are established...To study something historically means to study it in the process of change; that is the dialectical method's basic demand. To encompass in research the process of a given thing's development in all its phases and changes - from birth to death - fundamentally means to discover its nature, its essence, for "it is only in movement that a body shows what it is". Thus, the historical (that is in the broadest sense of history) study of behaviour is not an auxiliary aspect of theoretical study, but rather forms its very base. (Vygotsky, 1978, pp. 64-65)

Vygotsky approached methodological issues on two interrelated levels: the theoretical and the psychological. On the theoretical level he examined complex systems in the process of change, using dialectical logic to understand the interrelationships between components of the systems, and on a psychological level he chose research methods to capture the dynamics of process consistent with his theoretical approach (John-Steiner & Mahn, 1996). The focus of genetic analysis clearly lies in process. In this study the online course could be conceived as a

complex system, which in this case consists of a large group, small groups and individuals. The processes of interest are learner-learner interaction and knowledge construction during a 12 week academic term. The textual nature of communication within the course offers a dialectic means of examining the characteristics of the phenomena as learners engage in collaborative learning activities.

Wells (1999) emphasises a number of advantages of adopting a genetic approach which appear relevant given the purpose and context of this investigation. They include: an appreciation of the dialectic relationship between continuity and change; assistance to solve the problem of the relationship between the individual and his or her social and cultural environment; an opportunity to focus on participation in collaborative mediated activity on the one hand and on participants' practices and artefacts through which the activity is represented on the other; and the possibility of seeing how participants develop simultaneously as individuals with unique sets of competences and life trajectories and also as members of a wider cultural community.

A scholarly community often settles on an agreed-upon way to view a phenomenon, identifies an appropriate unit of analysis and then studies the phenomenon in ways that are congruent with consensually held conceptions (Salomon, 1993a). However, social and cultural approaches to psychology remain in a minority and there are no generally accepted theoretical foundations, methodology or delineated set of prescriptions for relating theory to practice (Cole, 1995; Wise & Quealy, 2006). Consequently, investigators are still developing research methods consistent with the assumptions of a socio-cultural perspective (Palinesar, 1998; Wertsch et al., 1995). It is also acknowledged that the assumptions of social constructivism are not easily implemented in research and practice and constructivist

assumptions often remain a theoretical prelude to ensuing empirical research (Stetsenko & Arieivitch, 1997).

The problem is compounded as there is perceived to be no unambiguous theory available to guide research on computer-mediated interaction (Stahl, 2003). Moreover there is a lack of consensus and ongoing debate about what constitutes an appropriate unit of analysis when adopting a genetic approach (Wertsch, 1985, 1991; Zinchenko, 1985). Although Vygotsky does not advocate a particular method, he does clarify the characteristics of an appropriate unit of analysis, as he explains:

By unit we mean a product of analysis which, in distinction from elements, possesses all the basic properties of a whole. Further, these properties must be a living portion of the unified whole which cannot be broken down further...A psychology that wishes to study complex units must understand this. Psychology must replace methods of analysis that decompose the whole into elements with a method that is based on units. It must discover the indissoluble units that preserve the properties inherent in the unified whole. It must find the units in which contradictory properties appear. It must use this kind of analysis to settle the questions that face us. (Vygotsky, 1934, as cited in Zinchenko, 1985, p. 97)

From a social constructivist perspective, a predominant methodological issue relates to an imperative to contextualise the learning process and to select a unit of analysis that represents multiple, interdependent perspectives (Rossi & Singh, 2007). In this investigation, the units of analysis were a large group, small groups and individuals. The units were interrelated, constituted the social structure of the course, formed the basis of the embedded case design and represented the case as a whole.

The phenomena of interest, the processes of interaction and knowledge construction, could be observed within each unit of analysis.

Salomon (1993b) suggests that when, for whatever reason, phenomena are examined in a new context, they require new units of analysis which in turn lead to the formation of new perceptions and definitions of the phenomenon and that changing the unit of analysis or changing the context in which a phenomenon is studied may reveal a qualitatively different phenomenon. In describing the principles of genetic analysis, John-Steiner and Mahn (1996) maintain that no universal schema can adequately represent the dynamic relation between external and internal aspects of development, as conditions constantly change and result in changed contexts and opportunities for learning. The authors contend that an emerging theme in both theory and practice is the collaborative and transformative ways in which knowledge is co-constructed and assert that there is a need for researchers to continue to develop methodological approaches that focus on process and provide ways of documenting change and transformation.

Strauss and Corbin (1998) have defined process as "...a series of evolving sequences of action/interaction that occur over time and space, changing or sometimes remaining the same in response to the situation or context" (p. 165). They maintain that if one studies process then one understands how persons act or interact but not why and that, because process and structure are inextricably linked, one must study both to capture the dynamic and evolving nature of events. There are, therefore, distinct similarities between the assumptions associated with grounded theory and Vygotsky's genetic theory of development. As the context plays a significant role, individuals and others are considered interdependent and the analytical focus of both involves an examination of the properties of social processes,

within social units (Glaser, 1978) or a functional system (John-Steiner & Mahn, 1996). This research examines how learners interact and construct knowledge using asynchronous and synchronous communication in online learning groups of different sizes.

3.4 Summary of the chapter

The content of this chapter was linked to the educational philosophy of the researcher discussed in Chapter 1 and the literature review presented in Chapter 2, which drew attention to the prevalence of constructivist perspectives in current learning and teaching practice and the adoption of constructivist frameworks within online learning research. Vygotsky's genetic theory of learning and development was identified as a sensitising topic and point of theoretical departure. An overview of the theory and a description of the main concepts which include semiotic mediation, the ZPD and genetic analysis were presented, together with an illustrated model of the researcher's conceptualisation of the theoretical constructs. The discussion highlighted the potential strength and limitations of the framework in relation to this investigation and drew comparisons between the assumptions underlying grounded theory and Vygotsky's integrated approach to genetic analysis.

CHAPTER 4 RESEARCH DESIGN

4.1 Introduction

The principal aim of this chapter is to outline and justify the research design by making explicit the links between the philosophical assumptions and theoretical perspective of the researcher and the strategy of inquiry selected to address the research questions. An additional purpose is to clarify the relationship between the researcher and the researched. Thus the content of the chapter is strongly associated with that of Chapter 1, which introduced the study and the researcher, Chapter 2, which identified the research problem and the purpose of the study, and Chapter 3, which acknowledged Vygotsky's theory of development as a potentially useful lens through which to view the data collected within this investigation. In order to achieve the objectives of this chapter, content has been structured around four of five elements of the research process, illustrated in Figure 4.1. The diagram depicts the researcher as the central component (Denzin & Lincoln, 2005) because the biography of the researcher influences each phase of the process. Here aspects of the researcher, pertinent to the investigation, are revealed during discussion of the appropriate phase, rather than in isolation.

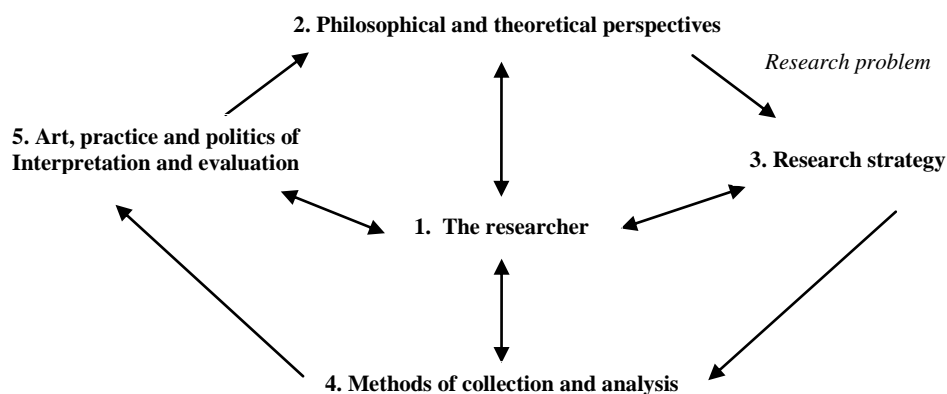


Figure 4.1 Elements of the research process and the relationships among them (adapted from Denzin & Lincoln, 2005, p. 23).

4.2 Philosophical and theoretical perspectives

As a system of inquiry, a paradigm is associated with a number of underlying assumptions (Denzin & Lincoln, 2005) and investigators need to examine and acknowledge their ontological, epistemological and axiological perspectives before undertaking any research project, primarily because the researcher's perceptions about reality, knowledge and truth play a significant role in the identification and framing of the research problem, the selection of a research strategy and the methods used to address research questions (Charmaz, 2006; Merriam, 1998; Piantanida et al., 2004). Essentially, paradigms define the world view of the researcher (Denzin & Lincoln, 2005) and provide an interpretive framework which then guides and structures research action (Denzin & Lincoln, 2005). Upon reflection and critique the assumptions and theoretical orientation of the researcher within this study are constructivist, evidenced in part by her educational philosophy and approach to teaching and learning and by her selection of Vygotsky's theory as a conceptual framework within the study.

Vygotsky's theory of development, which was identified in Chapter 3 as a point of theoretical departure for this investigation, reflects a constructivist paradigm. Philosophically, constructivism acknowledges the existence of multiple realities and the importance of prior experiences for learning and knowledge building (Schwandt, 1994). The strength of Vygotsky's theory lies in his explanation of the dynamic interdependence of social and individual processes in knowledge construction (John-Steiner & Mahn, 1996), and its relevance in this study is derived from the theoretical constructs which are found on the principle that individuals construct knowledge based on experience and constantly refine their knowledge of the world by interacting with the environment in social and cultural contexts (Kanuka &

Anderson, 1999). Table 4.1 identifies a range of issues associated with the research process and an overview of the philosophical assumptions connected with a constructivist perspective.

Table 4.1 Paradigmatic issues and philosophical assumptions from a constructivist perspective (adapted from Guba & Lincoln, 2005, pp. 121-212)

Paradigmatic issue	Philosophical questions	Constructivist perspective
Ontology	What is the nature of reality?	There are multiple realities. Reality is relative. Knowledge is co-constructed.
Epistemology	How will we know it? What is the relationship between the researcher and the researched?	Subjectively; the researcher and respondent co-create understandings. The researcher is a part of the research process.
Axiology	What ethics or values are involved?	Research is value laden. The researcher acknowledges biases and applies standards of credibility, transferability, dependability and confirmability.
Methodology	How should the researcher seek knowledge? What processes or methods will be used?	Naturalistic methods within real world contexts. Uses process oriented questions and inductive strategies. May use particular cases and simple statistical methods for locating groups of participants within larger populations
Representation	How will knowledge be narrated or presented?	Through rich descriptions, first-person accounts and multi-voiced texts

K. R. Howe (2003) maintains that the research framework is determined by the research questions, yet research questions are formed in response to a research problem, which is framed by the philosophical assumptions and theoretical perspective of the researcher. This assertion is supported by Patton (2002), who identifies central research questions within a range of theoretical traditions. Theoretical frameworks can therefore inform the design of a study as they may identify who and what will be examined or postulate relationships between the persons and the factors being investigated. These presumed relationships also have the potential to influence the order in which information is assembled, the type of

information collected and the level of detail obtained (Keeves & Sowden, 1997). The point made by Keeves and Sowden (1997) is illustrated to a certain extent within Table 4.1; the constructivist perspective of the researcher in this study had implications, *albeit* unknowingly at the outset, for the research framework, the type of research questions asked and the research strategy selected. Their argument is further supported by Vygotsky's theory of development, which is explicit about the interdependent relationship between the social and the individual processes of knowledge construction and the significance of the learning context.

4.2.1 A qualitative framework of study

Merriam (2002) asserts that “the key to understanding qualitative research lies with the idea that meaning is socially constructed, by individuals in interaction with their world” (p. 3); from Merriam's perspective, the precept for understanding qualitative research is based on a constructivist concept. The synergies between a constructivist perspective and a qualitative framework of study are also evident in Table 4.1, which emphasises the use of naturalistic methods within real world contexts. Qualitative researchers are concerned with questions about how people construct meanings (Merriam, 2009) and how these meanings may vary over different historical, cultural and individual contexts (L. Hewson & Hughes, 2005). Within a qualitative framework researchers also embrace subjectivity as part of the research process and the emphasis is on gathering rich, meaningful data that are amenable to thick interpretive description (C. Hewson, 2007). By contrast, quantitative frameworks are characterised by the generation of numerical data, statistical analysis and researchers who strive for objectivity in order to derive context free generalisations (C. Hewson, 2007). A quantitative framework of study would have been inappropriate in this investigation.

4.2.2 The research problem

Although connections between the philosophical assumptions and theoretical perspectives of the researcher and a research framework can be clearly drawn, the phenomena of interest within this study emerged from teaching practice and the researcher's experience within an online communication course. As indicated in Chapter 2, the purpose of this study was to explore and understand the relationship between learner-learner interaction and knowledge construction in online environments by analysing both processes within the computer-mediated context of an undergraduate course. To this end three research questions were formulated:

1. How do learners interact and construct knowledge within a large, asynchronous discussion group?
2. How do learners interact and construct knowledge in small asynchronous and synchronous discussion groups?
- 3a. How do individual learners conceptualise interaction and knowledge construction within the context of an online course?
- 3b. In what ways do learner perceptions shape communication and learning in online groups?

The research problem, the research questions and the adoption of a qualitative framework of study reflect the philosophical assumptions and theoretical perspective of the researcher within this investigation. The phenomena of interest occur in an authentic educational setting among learners in groups of different sizes, communicating asynchronously and synchronously to construct knowledge. Given the purpose of this research, a strategy was required that would facilitate the analyses of two complex social processes in diverse, but related, contexts.

4.3 Research strategy: A single case study with embedded case design

A research strategy consists of a set of skills, assumptions and practices that connect the researcher to specific methods of collecting and analysing data (Denzin & Lincoln, 2005). Within this study the researcher utilised a single case study with an embedded case design. Figure 4.2 provides an overview of the approach, identifying the case and three embedded units of analysis, which were based on the social structure of the course. The diagram incorporates the research questions, data sources and reference to two methods of data analysis utilised within the study: SNA and constant comparative method. The use of constructivist grounded theory procedures is acknowledged and an attempt has been made to illustrate the simultaneous collection and analysis of data and the purposeful, progressive nature of the process within the embedded case design (Miles & Huberman, 1994).



Figure 4.2 Overview of the research strategy

4.3.1 Case study research

Although the concept of a ‘case’ is a basic feature within social science and educational research there is considerable confusion about how it should be defined (Ragin, 1992), how it differs from other forms of qualitative research and when it is appropriate to use (Merriam, 1998). Stake (2005) contends that a case study is not a methodological choice but is instead a choice of what or who is to be studied, a view reinforced by Sturman (1997), who describes “case study” as a generic term for the investigation of an individual, group or phenomenon. Stake (2005) characterises a case as a complex entity that may be located in a number of contexts (cultural, historical, physical and/or social). The purpose is “to arrive at a comprehensive understanding of the groups under study” and “to develop general theoretical statements about regularities in social structure and process” (Becker, as cited in Merriam, 1998, p. 29).

As a research strategy, case study is particularly suited to the investigation of contemporary phenomena within real-life contexts, especially when the boundaries between the phenomena and the context are not clearly evident and when ‘how?’ or ‘why?’ questions are being asked about a set of events (Yin, 2003). Merriam (2002), emphasises that it is the unit of analysis, not the topic of investigation, that characterises a case study, the key determinant, being whether the case can be contained in some way (Merriam, 1998; Miles & Huberman, 1994; Yin, 2003). Given the research questions, the research setting and the phenomena of interest, case study was considered an appropriate research strategy for this investigation.

4.3.2 Embedded case design

One or more groups may be selected as a unit of analysis when certain characteristics associated with the group are thought to have significant implications

for the case being investigated (Patton, 2002). The units need not be mutually exclusive and the investigation of multiple units offers an opportunity to emphasise different aspects of the case, provide a different focus for the analysis of data and identify different levels at which statements about findings and conclusions may be made. Thus case designs which incorporate embedded units of analysis have the potential to enhance insights about a particular case or phenomenon (Yin, 2003).

Within this study the primary unit of analysis was an online course, which constitutes the case, and the large group, small groups and individuals represent subunits within the case; these units offered an opportunity to view learner interaction and knowledge construction among groups of different sizes communicating synchronously and asynchronously (see Figure 4.2). One of the strengths of the embedded case design is the ability to conduct a holistic, in depth investigation of the phenomena; moreover, illustrations of how the phenomena occur in different circumstances can provide valued and trustworthy knowledge (Stake, 2005)

4.3.3 Instrumental and intrinsic case studies

One of the most ‘unusual’ aspects of case study research is the selection of the case (Stake, 2005), the primary consideration being to learn most about the case or the phenomenon. This distinction is important as the selection of the case may be determined by the purpose of the study. When the analysis of a single case is to be undertaken, as it was in this study, it can be one of two general types: an intrinsic or an instrumental case study (Lipset, Trow, & Coleman, 2004; Stake, 1995; Yin, 2003). In an intrinsic case study the case is of primary interest and the focus of the investigation is to learn more about the case. In an instrumental case study the case is of secondary interest and is used as a means to an end, to provide insight into the

phenomenon (Lipset et al., 2004; Yin, 2003). The purpose of this research was to understand the relationship between learner-learner interaction and knowledge construction in online learning contexts thus the case study was instrumental, yet the course selected as a case also had intrinsic value. It is acknowledged that the line between intrinsic and instrumental case studies is not always distinct (Lipset et al., 2004; Stake, 2005) and that “a zone of combined purpose” (Stake, 2005, p. 445) may exist. This assertion is evidenced by the tendency of researchers to select a case when the case itself holds special interest (Lipset et al., 2004; Merriam, 1998; Stake, 1995).

4.3.3.1 Selection of the case

In case study research there are two levels of sampling; the first relates to the selection of the case, the second to the selection of participants, activities or documents within the case (Merriam, 2009). Discussion within this subsection relates to the purposeful selection of the case. The sequence and procedures related to the selection of participants, activities and documents within the case, known also as within-case sampling (Miles & Huberman, 1994) are discussed within section 4.4. Silverman (2002) suggests that:

Purposeful sampling allows us to choose a case because it illustrates some feature or process in which we are interested. However, this does not provide a simple approval to any case we happen to choose. Rather purposive sampling demands that we think critically about the parameters of the population we are interested in and choose our sample case carefully on this basis. (p. 104)

Instrumentally, the primary criterion for case selection is its ability to maximise what can be learnt about the phenomena (Stake, 1995). The purpose of this study was to understand the processes of learner-learner interaction and knowledge

construction and to explore the relationship between the two in online learning contexts. The case was required to meet the following criteria:

- Undergraduate program
- Online course of study
- Collaborative learning groups
- Interactive learners (synchronous/asynchronous communication)

The course selected as a case offered an opportunity to examine learner-learner interaction and knowledge construction among a single cohort of students in groups of different sizes as they engaged in synchronous and asynchronous discussion. In this respect it was atypical as it was the first fully online undergraduate course and the only interactive course of its kind to be offered by the department.

The course held intrinsic value as the researcher was also responsible for course development and coordination of three offerings, including the course selected as a case. A close relationship between the researcher and the setting and between the researcher and respondents is not uncommon within qualitative research (Robson, 2002), “with researchers spending a substantial amount of time in the natural setting of the study, often in intense contact with participants” (Merriam, 1998, p. 8). In such cases the researcher’s personal experiences and insights are considered an important part of the enquiry and may be critical to understanding the phenomenon (Patton, 2002). Within this study, the dual role of the researcher was considered beneficial rather than detrimental to the investigation. The ethical issues and potential for bias associated with the roles of the researcher are acknowledged and discussed within section 4.5 “The art, practices and politics of interpretation and evaluation”.

4.3.4 The case: Online communication course

The communication course was an undergraduate unit of study offered by a regional university in Australia. The university offers a wide range of undergraduate and postgraduate programs and courses both on-campus and off-campus. The course selected as a case was available from 6 March to 2 June 2006. Participants consisted of 20 students and one course co-ordinator, responsible for managing the course during the academic term. The course was a first year unit of study within a Health Promotion degree and an elective for several different programs offered across faculties throughout the university. Learners participating in this study were enrolled in eight different undergraduate programs.

4.3.4.1 Background

Historically, the course had been offered over a 10 year period on-campus, across multiple campuses and off-campus through print based materials. Course content introduced learners to different types of communication within a broad range of health care settings and facilitated the exploration of communication techniques within groups, with a view to improving health outcomes, through effective communication. However, as noted in Chapter 1, course evaluations from on-campus students indicated a desire for more discernable links between course content and the application of communication theory in health settings and off-campus students expressed a perceived inequity in their ability to engage with the educator and fellow students in the course materials and assessment items. An opportunity to remodel the course for online delivery presented itself in 2003; this afforded a means of structuring the course to enhance quality and to meet the perceived needs of both student groups. The intention, within the 2004 offering of the course, was to structure an authentic learning experience, with clearly demonstrable links between content

and practice and to provide the cohort of off-campus students with an interactive learning experience that would reflect the educational experience of on-campus students (Rossi & Hinton, 2005).

The online course was offered online for the first time in 2004, via Blackboard, a LMS newly adopted by the university. 177 students enrolled in the course; however, contrary to expectation students were not offered an alternative mode of delivery. Furthermore upon the decision to change to a single mode of delivery the teaching team was reduced from four campus-based lecturers to one staff member (Rossi & Hinton, 2005). Based on experience gained from the design and implementation of the first offering, modifications were made to the second offering of the online course, which was delivered during term 1, 2005. Owing to the restructure of two undergraduate programs, the number of enrolments reduced significantly; in 2005 34 learners enrolled in the course.

The aim within the 2006 offering of the course was to provide learners with an introduction to theoretical concepts and to encourage them to reflect upon their personal and professional experiences in order to identify personal needs, strengths and weaknesses in relation to communication. Through a range of interactive, learner-centred activities, students were offered opportunities to enhance personal, therapeutic, organisational and educational communication skills and to develop the ability to participate as effective members of a small, multidisciplinary team. The teaching and learning strategies were intended to encourage the active engagement of students with course content, fellow students and the course co-ordinator.

4.3.4.2 Educational philosophy and andragogical framework

The course required learners to work individually and collaboratively to complete learning activities in synchronous and asynchronous environments.

Students accessed the course by opening their web browser, entering their enrolment username and password and clicking on the “Login” button. Once they were logged into Blackboard, their customised homepage would appear and in the “My Courses” panel the courses that they were enrolled in were listed. On opening the communication course students were able to view and access any item within the course menu. Figure 4.3 provides an illustration of the course menu which has been expanded in some areas to provide a more detailed view of course structure, the relationship between course content and the weekly activities and the communication tools available to facilitate student interaction with peers and the course co-ordinator.

The course was designed to promote learner engagement with course content through weekly pre-reading material, PowerPoint presentations and a range of individual and group activities. The activities were directly related to the content for the week and varied in number. Over the duration of the course these activities offered students the opportunity to discuss and analyse written, observed and experienced interpersonal interactions. For example, content in week 3 addressed theoretical concepts associated with relationship development; the corresponding activities included an individual submission which required students to discuss and analyse a written scenario between two individuals from diverse cultural backgrounds.



Figure 4.3 Overview of the communication course

Two small group activities required students to observe interactions presented on a compact disk and to discuss and analyse aspects of self-disclosure and issues related to relationship development and maintenance. The “topical issue v class discussion” was a recurrent large group activity conducted asynchronously each week. In this group students were required to discuss, relate and/or demonstrate the application of communication theory to a given or selected topic or personal experiences.

Learners were required to complete three assignment items a summary of which is provided in Table 4.2.

Table 4.2 Assessment items within the communication course

<p>Assessment Item 1: Individual and group activities Weighting 25%</p> <p>(Due: weekly from week 3)</p>	<p>Participation, in discussion and completion of individual and group activities constituted assessment item 1 and were assessed weekly. Participation in online discussions was compulsory. The marking criteria for this assessment were available within the course profile.</p>
<p>Assessment Item 2: Critical incident analysis Weighting 25%</p> <p>(Due: Friday of week 7)</p>	<p>Learners were required to analyse critically, discuss and evaluate a given scenario based on their knowledge and understanding of communication theory. Specifically they were asked to identify the needs of the communicators, explore the communicators' use of language and non-verbal communication, describe the communication climate and discuss factors that may have influenced the outcome of the interaction. In addition learners were asked to identify at least two strategies that the communicators could have used to effect a more positive outcome.</p>
<p>Assessment Item 3: Critical reflection Weighting 50%</p> <p>(Due Friday of week 12)</p>	<p>Learners were asked to reflect critically upon an interpersonal or professional interaction. Assessment guidelines suggested that they:</p> <ol style="list-style-type: none"> 1. Describe the interaction 2. Identify the key communication elements of the experience 3. Analyse the elements in a way that demonstrates knowledge and understanding of communication theory 4. Demonstrate self awareness by explaining what was significant about the experience, to explore their feelings at the time of the experience, and to explain why they acted as they did and what they were trying to achieve 5. Comment on the factors that influenced the interaction and its outcome 6. Explain what they had learnt from the interaction and their critical reflection on it

As the focus of this investigation was upon how learners interact and construct knowledge in online contexts and on how learner perceptions of the learning context shape communication and learning within an online course, there was a significant link between assessment item 1 and the data collected from the archive of the course.

This section identified the research strategy within this investigation as a single case study with an embedded case design. It also offered a rationale for the approach, differentiated between different types of case study and provided a description of the course selected as a case. The following section delineates the

methods of data collection and analyses, the procedures associated with the methods and the treatment of data within the study.

4.4 Methods of data collection and analyses

The analysis of case study evidence is recognised to be “one of the least developed and most difficult aspects of doing case studies” (Yin, 2003, p. 109), and neither Vygotsky’s theoretical framework nor case study offers specific analytical methods for the analysis of data. Instead it is acknowledged that case study lends itself to the integration of quantitative and qualitative data and that multiple methods may be used to gain a comprehensive understanding of the phenomena and the case (Merriam, 1998). Moreover, as it is the unit of analysis that defines a case study, different approaches may be combined within case study research (Merriam, 2009).

Within this investigation two diverse but complementary methods were used to examine and understand the relationship between learner interaction and knowledge construction in online learning contexts, SNA and constant comparative method, which incorporated the analytical procedures associated with constructivist grounded theory (see subsection 4.4.3). SNA provided a macro level analysis of the interactions that facilitated knowledge construction within the online course, while constant comparative method provided micro level analyses of the processes of interaction and knowledge construction within synchronous and asynchronous discussion. No studies utilising this particular sequence and combination of methods were located within extant literature; however, Patton (2002) points out that, because each qualitative study is unique, the analytical approach by researchers will also be distinctive.

Constant comparative method is “a method that generates successively more abstract concepts and theories through inductive processes of comparing data with

data, data with category, category with category and category with concept. Comparisons then constitute each stage of analytic development” (Charmaz, 2006, p. 187). This method of analysis forms the basis of grounded theory and has been used in a wide range of qualitative studies and adopted by many researchers who do not seek to build a theory (Charmaz, 2006; Merriam, 1998, 2009). This is because the analytic procedures are compatible with the inductive concept-building orientation of qualitative research (Merriam, 1998). As a result the use of constant comparative method need not result in the construction of a substantive theory (Merriam, 2009) but the findings and assertions derived from the analytic process are grounded in the data (Charmaz, 2005, 2006; Merriam, 1998).

The term “grounded theory” refers to a method, a specific mode of analysis and a product of inquiry (Charmaz, 2005). A grounded theory may be derived from constant comparative method although the two are not mutually exclusive. A grounded theory approach is adopted when the aim is to build a substantive theory; however, that was not the intent within this study. Within this investigation constant comparative method were utilised to analyse and understand the relationship between learner-learner interaction and knowledge construction in online learning contexts. As a theory was constructed from the comparative analysis of case data the research was retrospectively acknowledged as a grounded theory study (see Figure 4.4). This outcome is congruent with Merriam’s assertion that a theory can be built from within a case study but “only when a substantive theory results is the study considered a grounded theory study” (Merriam, 2009, p. 31).



Figure 4.4 Retrospective overview of the case study

4.4.1 Data collection

Discussion within this subsection relates to second level sampling - that is the selection of participants, activities and documents within the case (Merriam, 2009). Within a qualitative study the collection and analysis of data occurs simultaneously and the selection of data is most often purposeful. Through analysis the researcher endeavours to make sense of the data, which involves consolidating, reducing and interpreting what people have said and what they themselves have seen and read (Merriam, 2009); however, first the researcher must select who, what, when and where to collect data from.

4.4.1.1 Participants

This study utilises an embedded case design; three units of analysis were identified based on the social structure of the course. Participants within this investigation consisted of 20 students who completed a 12 week communication course and consented to take part in the study (see section 4.5) and the researcher who fulfilled the role of course co-ordinator during the academic term. Each learner as a member of the large group, a small group and an individual within the course was represented within each unit of analysis within the case. Of the 20 students 10% were male. The age of participants ranged from 19 to 61 years of age, the mean was 31 years of age, the median 23 years of age and the mode 21 years of age.

4.4.1.2 Activities

The focus of this investigation was upon two interrelated processes, learner-learner interaction and knowledge construction. Processes are contextually located and purported to be represented in data as happenings and events that may or may not occur in continuous forms. While often described as stages or phases, processes

can also be examined in terms of sequences or shifts in the nature of action and/or interaction (Strauss & Corbin, 1998). In order to understand a construct it is necessary to see different instances of it in different places with different people (Glaser & Strauss, 1967). Within this case study, interaction and knowledge construction occurred weekly among learners in groups of different sizes through synchronous and asynchronous communication during a 12 week term.

4.4.1.3 Documents

Qualitative case studies can draw data from multiple sources including; documents, archival records, interviews, direct observation, participant observation, and physical artifacts (Stake, 1995; Yin, 1994). The principal sources of data within this study were electronic transcripts, retrieved retrospectively from an archive of the communication course. Observational data were recorded in an electronic journal retained by the co-ordinator during the course (participant observation) and from transcripts of participant interaction (direct observation). Data were also obtained from non-interactive, static records produced by the LMS in the form of system logs and course statistics (see Figure 4.4).

Merriam (1998) suggests that online data collection offers an extension of familiar data collection techniques and that the medium has the potential to provide access to a wider scope of data. However as electronic transcripts, from computer-mediated discussions, provide a means of ‘observing’ participant behaviour during and after an exchange and offer transcripts of interactions, events and incidents, which are not subject to change over time, the value of online data is, arguably, greater than Merriam purports. C. Hewson (2007) acknowledges that in internet mediated research the distinction between observational methods and document analysis is blurred as both approaches involve the examination of electronically

stored records. Merriam (2009) recommends that researchers undertaking online research consider: the effects the context has on the data, the effects of software functionality on the data collection process and the effects of the medium on ethical practice. Within this dissertation discussion of the effects of the context are incorporated within the results of the study, the effects of software functionality on data collection are noted within section 6.6 which identifies limitations of the study and ethical issues associated with data collection from the case are discussed within section 4.5.

4.4.1.4 Sequence and purpose of data collection

Data collection and analyses commenced with the large group. This initial selection provided a point of departure in terms of sampling (Charmaz, 2006) and maximised opportunities to identify events, incidents or happenings indicative of learner interaction and/or knowledge construction within the group during asynchronous discussion. Preliminary analysis of the large group informed subsequent sampling. The selection of small groups and individuals was not predetermined. This process is characteristic of embedded case designs as “within case sampling” is recognised to be almost always nested, sampling tends to be theoretically or conceptually driven and the process is progressive (Miles & Huberman, 1994). These procedures are congruent with those of grounded theory which does not detail data collection techniques; instead the process is designed to move the analysis towards the development, refinement and interrelation of concepts using a two-step coding process, comparative methods, memo writing and sampling to refine emerging theoretical ideas (Charmaz, 2000). A more detailed description of the processes and procedures associated with grounded theory are provided in subsection 4.4.3.

As one of the phenomena of interest was the relationship between learner-learner interaction and knowledge construction, the selection of activities was more important than that of participants. Analytically attention was directed towards the representativeness of concepts and how those concepts varied dimensionally as opposed to the selection of a representative population sample (Strauss & Corbin, 1998). This approach to data collection and data analyses was appropriate in this investigation as single case studies are considered generalisable to theoretical propositions, not to populations (Yin, 2003).

4.4.2. Data analysis: Social network analysis

Social network analysis (SNA) is a method of mapping and measuring relationships and flows of information between people and groups; it provides a visual and mathematical analysis based on the way actors are connected, in order to identify underlying patterns in interactions (Scott, 2000; Wasserman & Faust, 1994). A 'social network' is defined as a group of collaborating entities that are related to one another; each participant is called an actor and depicted as a node within a graph, while the relations between actors are illustrated as lines or links between corresponding nodes. Two properties of relations are important for understanding their measurement; these are whether the relation is directional or non-directional and whether it is dichotomous or valued (Aviv, Erlich, Ravid, & Geva, 2003). In a directional relation the relational tie between a pair of actors has an origin and a destination, reflected within graphs by arrowheads. A relation is dichotomous if it is present or absent. Valued relations can refer to the strength, intensity or frequency of the tie between each pair of actors. In this study the concepts of direction and value were fundamental to the examination of interaction between learners within the

course and to the identification of interactive patterns as participants collaborated to complete learning activities.

Social network data can be observed at a number of levels and as a result data can be modelled or summarised at the levels of: actor, dyad, triad, subgroup, set of actors or a network. Generally social networks are of a single mode and describe ties between pairs of actors, although there are variations which include two mode and affiliated networks. Two mode networks have two sets of actors while affiliated networks have two modes but only one set of actors and a set of events (Wasserman & Faust, 1994). The actors in affiliated networks are brought together through their joint participation in 'social events'. The network in this case was complex; the actors were learners engaged in online activities which constituted educational events; thus it had two modes and one set of actors. Learners had ties to the activities, the set of actors which constituted the large group and to subgroups which collaborated to complete small group activities, throughout the 12 week term. Thus the SNA in this investigation reflected an affiliated network and data were observed at network, group and individual levels.

Figure 4.5 illustrates the principles of social network analysis, described in previous paragraphs. Within the diagram A, B and C represent nodes within the social network of the course. Nodes A and B represent actors or participants, node C represents a learning activity, thus the diagram illustrates an affiliated network. The lines between the nodes show the links between actors and between actors and the learning activity, arrowheads denote the direction of the connection and the numbers represent the strength of the link, or in this case the number of posts or contributions. Note that within the diagram the direction between the actors and the learning

activity is one-way and that the strength of the link between learners and the activity differs as does the strength of the link between participants.

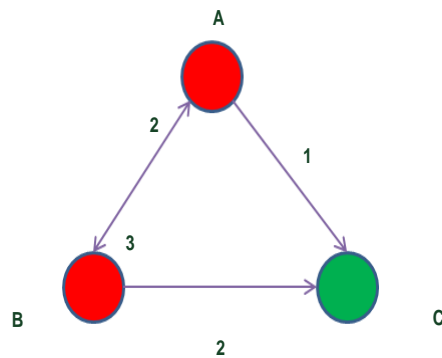


Figure 4.5 A directional and valued sociogram

The rationale for studying the affiliated network was congruent with the principles of the theoretical framework within the investigation because both acknowledge the interdependence between individuals and their social connections. As Wasserman and Faust, (1994) point out, if we consider the ties between actors or between events as potential conduits of information then the connectedness of the affiliation network is important because information originating at any event or with any actor can potentially reach any other event or any other actor. Given the structure of the course and the intention to analyse and understand the nature of learner interaction and knowledge construction over the academic term it was important to view the network as a social system and to examine the connections among actors (learners) and between actors and events (weekly activities).

The methods for studying two-mode affiliation networks are considered less well developed than those for studying one mode networks and there are very few methods for studying actors and events simultaneously. As a result, data on affiliated networks can provide only standard one-mode socio-metric arrays and establish

linkages among the entities in each of the two modes - that is among actors and/or between actors and events (Wasserman & Faust, 1994).

There is support for the notion of combining SNA with other qualitative methods in order to examine interaction and learning in computer-mediated environments, although the tendency within reported studies, is to link SNA with content analysis (Aviv et al., 2003; de Laat, Lally, Lipponen, & Simons, 2007; Zhu, 2006). For the most part researchers use content analysis to evaluate the quality of the knowledge construction process (Aviv et al., 2003) or the level of cognitive engagement (Zhu, 2006) and SNA to analyse network structures and the nature of interaction patterns (de Laat et al., 2007; Zhu, 2006). Content analysis tends to precede SNA and SNA is used to synthesise and extend the researcher's understanding of teaching and learning processes in online environments (Aviv et al., 2003). Within the studies reviewed, researchers recognised the novelty of their approach (de Laat et al., 2007) and acknowledged that their combination of methods constituted a new methodological means of analysing participation, interaction and learning in online environments (de Laat et al., 2007; Zhu, 2006). An increase in this particular type of research has been observed (Zhu, 2006).

Feld (1981) considered the task of the network analyst to be “the investigation of those social structural characteristics that serve to organize the activities underlying the social ties of a network” (p. 1016). He asserts that, while SNA may be used to uncover patterns among social relationships, theoretical explanations of the patterns are inadequate because they lack contextual information about the ties individuals had with ‘extra-network foci’ (p. 1016). Feld (1981) believed that the further development of an integrated theory and use of data analysis techniques that could simultaneously analyse network and other structural data could

contribute to a better understanding of social structures as a whole. Feld's view is supported by Charmaz (2006), who suggests that "Interpretive theorizing can infuse network analysis with the tools to bring meanings into view" (p. 129). Although grounded theory is a method that complements other approaches (Charmaz, 2006) and has the capacity to develop and extend theoretical perspectives, no examples of studies combining SNA and grounded theory were found within the extant literature.

Within this study SNA was undertaken prior to analyses of the content of learner contributions, because it offered a structural perspective and facilitated a macro level analysis of the interactions through which knowledge was constructed. The analytical procedures of constructivist grounded theory were then used to conduct micro level analyses of the processes of interaction and knowledge construction. This sequence and combination of methods afforded the means to understand and explain interactive patterns identified through SNA and to extend the analyses to explore and understand the relationship between interaction and knowledge construction in computer-mediated contexts. A number of researchers have used SNA to investigate interaction over time (Daradoumis, Martinez-Mones, & Xhafa, 2004; Hara et al., 2000; Haythornthwaite, 2001). This type of analysis could be achieved by studying one or more relations at fixed intervals of time (Wasserman & Faust, 1994) and it was a feature of SNA that held particular interest as it offered an opportunity to analyse change in patterns of interaction among learners over the 12 week term.

4.4.2.1 Procedures and treatment of data

Generally social network data are collected by observing, interviewing or questioning individual actors about the ties from these actors to other actors in the set. As the information is obtained by having individuals report on their own

interactions the accuracy of the reports can be a concern (Wasserman & Faust, 1994). In this study data were collected from the electronic archive of the course and individuals were not required to self report; instead the LMS provided a chronological log of communication between participants and an electronic transcript of the interactions that took place. As a result the data collected were reliable and accurate.

However, the flow of messages between learners was difficult to discern from the list view logs of the LMS. The problem with the format was compounded by the number of learners in the group, their failure to use or their incorrect use of the threaded discussion function and their practice of submitting messages which contained responses to more than one individual within a single post. The format and complexity of the data made it difficult for the researcher to visualise interactions among learners within the large group. As a result data derived from system logs and from the content of messages were uploaded into InFlow (Krebs, 2005), a computer software program designed to provide a visual and a mathematical analysis of the flow of information between individuals and groups. Data from the large group were organised into 12 networks, each reflecting one academic week within the course. Nodes were created for each learner, the course co-ordinator and activities within each network). A link data file was created in a .csv document which identified who the message was from, who the message was to, the value of the link and the network, each learner was identified by a pseudonym (see Appendix A). The links between participants in this study reflected both direct and indirect connections as they were discerned from two sources: system logs and the content of learner posts. This combination provided a more accurate reflection of interaction within the large group.

4.4.3. Data analysis: Constant comparative method and constructivist grounded theory

The constant comparative method of data analysis was developed by Glaser and Strauss (1967) as the means of developing a grounded theory. Grounded theory has evolved since its inception with notable revisions in the positions of the originators (Charmaz, 2006), extensions (Clarke, 2005) and subsequent interpretations by others (Charmaz, 2006). Changes in perspectives have led to the use of contrasting terms such as “traditional” (Clarke, 2005) and “contemporary” (Charmaz, 2005) or “objectivist” and “constructivist” grounded theory (Charmaz, 2006). Differences relate to the origins of the method and the philosophical stance of the researcher; constructivist grounded theory is located within an interpretive tradition while objectivist grounded theory adopts a positivist position (Charmaz, 2006). Table 4.3 provides an overview of grounded theory from objectivist and constructivist viewpoints.

Table 4.3 Overview of objectivist and constructivist perspectives of grounded theory (adapted from Charmaz 2006, pp. 43-71, 123-149)

	OBJECTIVIST GROUNDED THEORY	CONSTRUCTIVIST GROUNDED THEORY
Philosophical stance	<i>Positivist</i> Assumes data represents objective facts about a knowable world	<i>Interpretive</i> Assumes emergent, multiple realities and provisional truth
Purpose	<i>Explanation and prediction</i> Seeks causes, favours deterministic explanations, and emphasises generality and universality	<i>Understanding</i> Calls for understanding of the studied phenomenon, the aim is to show the complexities of particular worlds, views and actions.
Role of the researcher	The researcher is a conduit rather than a creator	Researcher an integral component of the study: data and analysis created from shared experiences and relationship with participants
Logic of inquiry	View concepts as variables Specify relationships between concepts Explain and predict these relationships Systematise knowledge Verify theoretical relationships through hypothesis testing Generate hypothesis for research	Conceptualise the studied phenomenon to understand it in abstract terms Articulate theoretical claims pertaining to scope depth power and relevance Acknowledge subjectivity in theorising hence the role of negotiation dialogue and understanding
Guidelines/ Procedures	Rigid - careful application of methods will produce theoretical understanding Theoretical sampling 3 levels of analysis Level 1 – Descriptive, the basis for abstract interpretation Level 2 - Conceptual ordering – category formation Level 3- Theorising – conceiving concepts and formulation of a well developed category Cohesiveness occurs through the use of an overarching concept which explains the what, how when where and why of the phenomenon Types of coding Open coding – identifying concepts, properties and dimensions discovered in data Axial coding –process of relating categories to their subcategories (occurs around the axis of a category) Selective coding - process of integrating and refining the theory Comparative methods – process of comparing different pieces of data for similarities or differences Memos – written records of analysis	Flexible - analytic directions arise from how researchers interact with and interpret their data not from external prescriptions Initial and theoretical sampling 3 levels of analysis Level 1 – Descriptive, the basis for abstract interpretation Level 2 - Conceptual ordering – category formation Level 3- Theorising – conceiving concepts Does not adhere to the notion of locating a single process or core category (though does not exclude) Types of coding (2 or more) Initial coding - provisional, comparative, grounded in the data Focused coding - directed selective and conceptual Axial coding – the process of relating categories to their subcategories Theoretical coding - follows codes selected during focused coding, specifies possible relationships between categories, may preclude the need for axial coding Comparative methods – process of comparing different pieces of data for similarities or differences Memo writing - written records of analysis
Product of the inquiry	Theory is discovered	Theory is constructed, constitutes an emergent interpretation

It is acknowledged that a grounded theory may include positivist and interpretivist inclinations; as a result a study is judged by the extent to which its key characteristics conform to one tradition or another (Charmaz, 2006). Within this study constant comparative method was utilised as a mode of analysis yet the product of the investigation was a conceptual understanding of the phenomena, grounded in the data. Based on the philosophical assumptions of the researcher, the purpose of the investigation, the perceived role of the researcher and the logic underpinning the study, the substantive theory constructed from this case was constructivist in orientation.

The analytic processes of objectivist and constructivist grounded theory are not dissimilar. However, researchers can invoke constructivist procedures for diverse analytic and substantive problems because they "...can draw on the flexibility of grounded theory without transforming it into rigid prescriptions concerning data collection, analysis, theoretical leanings, and epistemological positions" (Charmaz, 2006, p. 178). Grounded theory is particularly useful in addressing questions about process (Merriam, 2009) and the analytical guidelines enable researchers to focus their data collection and to build middle-range theories through successive levels of data analysis and conceptual development (Charmaz, 2005). Within constructivist grounded theory analytic directions arise from how researchers interact with and interpret their data and conceptual generality emerges from the analytic process, not from a prescribed goal (Charmaz, 2006).

The aim of this study was to understand the processes of learner-learner interaction and knowledge construction and the relationship between them in online learning contexts. The analysis of data led to the development of two detailed categories which enhanced the researcher's understanding of the complex processes

under investigation. Merriam observes that “...data often seem to beg for continued analysis past the formation of categories....This often leads to trying to link the conceptual elements – the categories together in some meaningful way” (Merriam, 2009, p. 189). The sustained analysis in this investigation facilitated a conceptual understanding and enabled the researcher to construct a propositional theory about the relationship between learner-learner interaction and knowledge construction in online learning contexts. Merriam (2009) provides an explanation for this unintended outcome:

When categories and their properties are reduced refined and then linked together, the analysis is moving toward the development of a model or theory to explain the data’s meaning. This level of analysis transcends the formation of categories for a theory seeks to explain a large number of phenomena and tell how they are related. (Merriam, 2009, p.192)

Disagreements about how to do grounded theory and what a completed theory looks like arise from unsettled notions about what theory means; indeed, Charmaz (2006) draws attention to the fact that few theorists actually define their understanding of the term and lists a range of labels that have been used to describe the product of a grounded theory study – for example, “1) an empirical generalisation, 2) a category, 3) a predisposition, 4) an explication of a process, 5) a relationship between variables, 6) an explanation, 7) an abstract understanding and 8) a description” (Charmaz, 2006, p. 133). Strauss and Corbin (1997) define theory as “A set of well-developed concepts related through statements of relationship, which together constitute an integrated framework that can be used to explain or predict phenomena” (p. 15). Prediction is a notion that does not sit well within a

constructivist framework yet the description, with the exclusion of this expectation, reflects both the process and the product of the analysis within this study.

4.4.3.1 Procedures and treatment of data

The procedures of grounded theory are designed to develop a well integrated set of concepts that provide a theoretical explanation of the phenomenon under investigation, as Charmaz (2000) explains:

The rigor of grounded theory approaches offers qualitative researchers a set of clear guidelines from which to build explanatory frameworks that specify relationships among concepts. Grounded theory methods do not detail data collection techniques; they move each step of the analytic process towards the development, refinement, and interrelation of concepts. The strategies of grounded theory include (a) simultaneous collection and analysis of data, (b) a two-step data coding process, (c) comparative methods, (d) memo writing aimed at the construction of conceptual analyses, (e) sampling to refine the researcher's emerging theoretical ideas, and (f) integration of the theoretical framework. (pp. 510-511)

4.4.3.1.1 Initial and theoretical sampling

Initial and theoretical sampling mirrors the two level sampling process that Merriam (2009) associates with case study research. In grounded theory initial sampling may be determined prior to entering the research field and in advance of data collection and is exemplified by sampling to address research questions and/or to reflect a population or its distributions (Charmaz, 2006). In this study initial sampling relates to the selection of the population and data. The population is recognised as participants in the course and distributions reflect the embedded units

of analysis within the case. The initial selections of data were obtained from large group discussions during weeks 2, 6, and 11. Theoretical sampling relates to the process of seeking data to elaborate and refine the categories that constitute a theory (Charmaz, 2006). The aim is to collect data from places, people and events that will maximise opportunities to develop categories and to identify relationships between concepts (Corbin & Strauss, 2008). The process is emergent, purposeful and recognised practice within embedded case designs. Table 4.4 outlines the sequence and purpose of initial and theoretical sampling within the case.

Table 4.4 Sequence and purpose of initial and theoretical sampling within the case

Embedded units of analysis (study participants)	Purpose
<p style="text-align: center;">1. Large group</p> <p>A total of 21 students completed the online communications course; 20 agreed to participate in the study. All students enrolled in the course were required to interact and contribute to a weekly discussion or debate which was conducted in an asynchronous environment. A class discussion forum was utilised by the learners throughout the 12 week term for this recurrent activity.</p>	<p style="text-align: center;">Initial</p> <p>Maximum variation and point of departure for theoretical sampling</p>
<p style="text-align: center;">2. Small groups</p> <p>All students enrolled in the course were placed in small online groups, varying in size from three to five students. There were five online groups, each with access to a range of communication tools. Group members were required to liaise with one another in order to discuss and respond to a series of weekly activities. Learners within these groups used combinations of synchronous and asynchronous environments throughout the 12 week term in order to address set activities.</p>	<p style="text-align: center;">Theoretical</p> <p>Dimensional range/ conceptual variation</p>
<p style="text-align: center;">3. Individuals</p> <p>All students were required to communicate synchronously and asynchronously individually and as members of a large and small group in order to meet course requirements. The focus of analysis within this unit was upon individual conceptions of interaction and knowledge construction within online learning contexts and how those perceptions may shape communication and learning in online groups.</p>	<p style="text-align: center;">Theoretical</p> <p>Conceptual variation</p>

The collection of data from diverse groups provided access to a range of conceptually relevant data and an opportunity to identify similarities and differences in the relationship between interaction and knowledge construction in structurally

different learning contexts. When choosing groups for theoretical relevance two sampling questions arise: how many groups and to what degree should one collect data from one group? Glaser and Strauss (1967) assert that the most that may be gained from the study of one group is basic categories and a few of their properties and that from the study of similar groups or subgroups within the first group a few more categories and their properties may be identified. The large corpus of data afforded by the electronic archive of the course offered an advantage as complete data sets from each unit of analysis could be accessed as a resource. However, there is a limit to how many data a single researcher can analyse (Peräkylä, 2004).

In this study the decision about where to commence data collection was informed by the outcome of the SNA discussed briefly in subsection 4.4.2.1. Raw data were imported into the qualitative data analysis software program NVivo (QSR, Version 7, 2006). Primarily the program was used as a means of storing and managing the large number of data accessed and downloaded from the archive of the course. Later the program was utilised to code, recode and annotate documents and to create memos about observations, developing categories and the ongoing analysis.

Figure 4.6 provides an overview of the coding procedures utilised within this study.

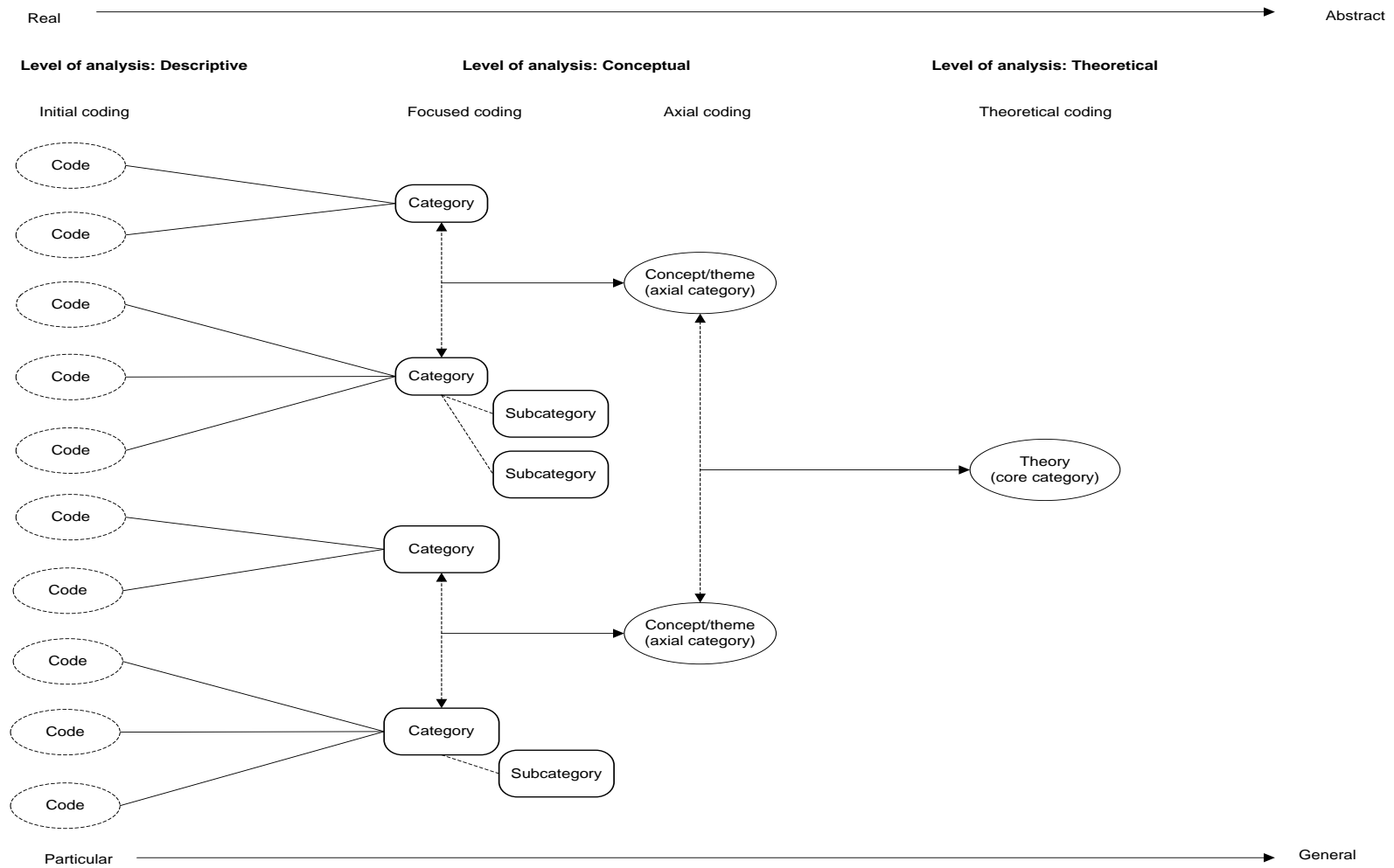


Figure 4.6 Overview of coding procedures within the study (adapted from Saldana, 2009, p. 12)

4.4.3.1.2 Initial coding

Within the analytical framework of constructivist grounded theory data are subjected to a multilevel analysis through a successive coding process, which includes initial, focused and theoretical stages (Charmaz, 2006). Coding involves naming segments of data with a label that simultaneously categorises, summarises and accounts for each piece (Charmaz, 2006). Codes are provisional as they may be reworded to improve their fit and part of the fit is the degree to which each code captures and condenses meanings and actions. Two criteria have been identified for a coded unit of data; first it should reveal information relevant to the study and stimulate the reader to think beyond the particular bit of information and second it should be “the smallest piece of information about something that can stand by itself – that is it must be interpretable in the absence of any additional information other than a broad understanding of the context in which the inquiry is carried out” (Lincoln & Guba, 1985, p. 345). This means codes can be applied to words, lines, segments or incidents; the approach adopted is dependent upon the type of data, their level of abstraction, the stage of the research process and the purpose of data collection (Charmaz, 2006).

The use of borrowed schemes can be more difficult than coding for emergent categories because they have not been specifically designed; thus while preconceived theoretical concepts, such as Vygotsky’s theory of development, may provide a starting point for looking at data they do not offer automatic codes for analysing data (Charmaz, 2006). Within this study initial codes emerged from a preliminary review of data from the large group. However, the researcher acknowledges sensitivity to concepts associated with Vygotsky’s theory of development, previous research and knowledge of the course. Appendix B provides examples from the initial coding list

and includes an excerpt from an associated procedural memo. The language within NVivo recognises initial codes as free nodes; these nodes or codes are generally descriptive and used for unorganised or emergent ideas (Richards, 2005). The procedural memo identifies a coding difficulty as data could be coded in more than one way; because of this a potential threat to the trustworthiness of the coding was acknowledged. The researchers concern was reflected in previous online research as Henri (1992) had also observed that messages generated by computer-mediated communication “harbour more than one unit of meaning” (p. 134). At the time the problem was believed to be related to the type of data, which constituted artefacts created by the participants during the online course rather than data produced in response to the researcher’s questions. The issue was considered further within memos associated with focused coding.

4.4.3.1.3 Focused coding

Focused coding is the second major phase in constructivist grounded theory and involves decisions about which initial codes make the most analytic sense to categorise data. Coding in this phase is more directed, selective and conceptual than the word by word, line by line and incident by incident coding in the previous phase. As previously indicated, Charmaz (2006) emphasises a two-step coding procedure within constructivist grounded theory; initial and focused. From her perspective, axial and theoretical coding may be subsumed or precluded by focused coding. In this study it was useful to view focused coding as the clustering and development of categories and subcategories derived from initial coding. From these categories two main categories were subsequently constructed and from the analyses of the links and relationship between these a core category was identified. Appendix C offers examples of the categories constructed and developed through focused coding.

Within NVivo a category with subcategories is termed a “tree node”. Excerpts from procedural memos created during the focused coding process are also included.

Ultimately coding was based on a meaningful unit of data, which was made meaningful by the analytical objective (Henri, 1992), not a predetermined length. Although this approach has been criticised because it relies on potentially inconsistent judgements about whether or not a set of wordings constitutes a single meaning or more than one (Howell-Richardson & Mellar, 1996; Rourke, Anderson, Garrison, & Archer, 2000), it is also acknowledged that the selection of a codable unit involves compromise (Krippendorff, 1980).

4.4.3.1.4 Axial coding

Axial coding is the term used to describe the process of relating categories to subcategories. The purpose of axial coding is to sort, synthesise and organise large numbers of data and reassemble them in new ways (Strauss & Corbin, 1998). This type of coding occurs around the axis of the category, linking occurs at the level of the properties and dimensions and relationships are made visible by connections among the conditions, actions/interactions and consequences (Merriam, 2009). Although Charmaz (2006) has in previous research developed categories and subcategories, she does not use formal axial coding procedures. Clarke (2005) offers an alternative as she envisages axial coding as the elaboration of a category and employs diagramming as part of the analytical process. Diagrams have been utilised within this study to visualise categories and the connections between them. Figure 4.7 illustrates the process of category development.

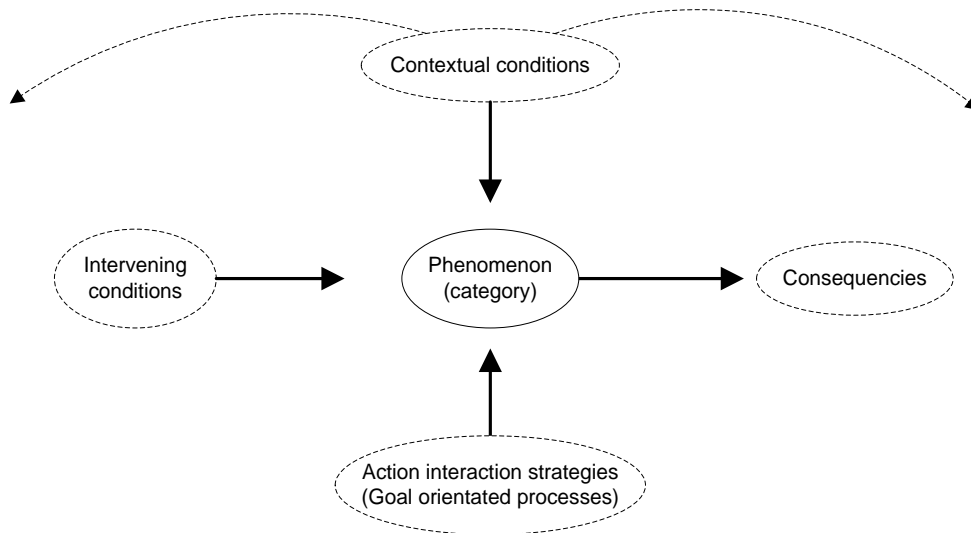


Figure 4.7 Category development (adapted from Böhm, 2004, p. 272).

Two axial categories were constructed during this research: learner-learner interaction (see Figure 4.8) and knowledge and understanding (see Figure 4.9). The interrelated categories were developed during the coding process and make a significant contribution to the researcher's understanding of the relationship between interaction and knowledge construction in online learning contexts. It is acknowledged that as conceptual understanding is derived from the coding process the lines between process and product may become blurred within a grounded theory study (Charmaz, 2006). However, it is necessary within this dissertation, to distinguish between the two and there arises a dilemma about how best to differentiate and present these interrelated aspects of the research. As a result an abbreviated version of each category is presented below and a detailed illustration and discussion are provided within Chapter 5.

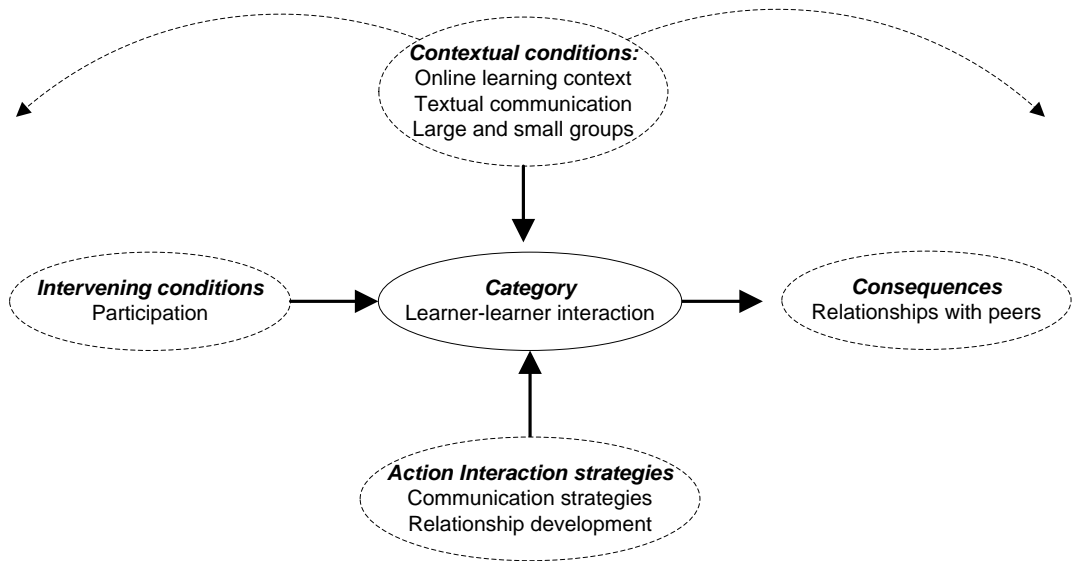


Figure 4.8 Abbreviated illustration of the axial category learner-learner interaction

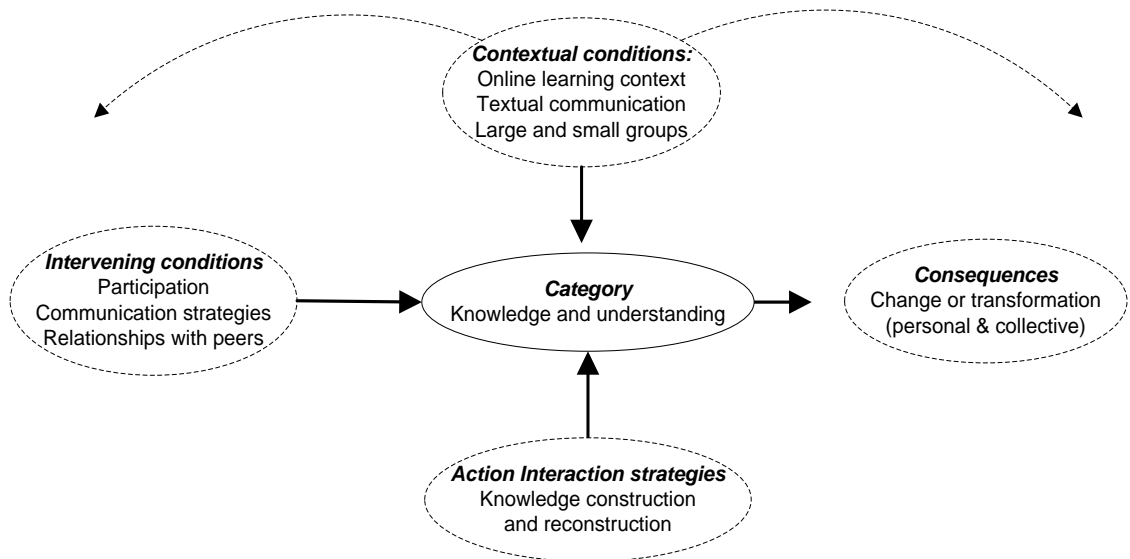


Figure 4.9 Abbreviated illustration of the axial category knowledge and understanding

It is important to note the overlap in the content of these two categories. Merriam (2009) suggests that if data can be placed in more than one category it indicates that further conceptualisation is required to refine the category. However, as Graneheim and Lundman (2004) point out, “owing to the intertwined nature of human experiences, it is not always possible to create mutually exclusive categories

when a text deals with experiences” (p. 107). Their view reflects that of Charmaz (2006), who asserts that “...those who take a constructivist approach aim to show the complexities of particular worlds, views, and actions” (p. 132) and that researchers need not adhere to the notion of variable analysis or of finding a single core category in the studied phenomena.

4.4.3.1.5 Theoretical coding and construction of a grounded theory

Theoretical coding is a sophisticated level of coding that brings data back together, specifying possible relationships between categories. The generation of a theory generally occurs around a core category, which has explanatory relevance because of its potential to link all of the other categories together. The analytical power of the category is derived from the fact that it can convey, theoretically, what the research is all about. The core category may evolve out of existing categories or if these are determined as being incomplete a more inclusive category may be constructed (Corbin & Strauss, 2008). In this study the core category was derived from the links between the two axial categories. Interestingly, Merriam (2009) asserts the reverse, that it is through theories that the relationships between phenomena become visible. Corbin and Strauss (2008 p. 105) describe the characteristics of a core category in the following way:

- It must be abstract; that is all other major categories can be related to it and placed under it
- It must appear frequently in the data; that is within all or almost all cases there are indicators pointing to that concept
- It must be logical and consistent with the data
- It should be sufficiently abstract so that it can be used to do research in other substantive areas leading to the development of a more general theory

- It should grow in depth and explanatory power as each of the other categories is related to it through statements of relationship.

A theory requires more than a report of conditions, categories, actions and consequences; the relationship between categories also needs to be explained. Clarke (2005) utilises integrative diagrams to link categories and form a substantive theory of action; her work is based on and offers an extension of Strauss's earlier work on social worlds and social arenas (Strauss, 1978). Her approach is pertinent to this investigation given the social structure of the case and the conceptual framework underpinning the study: She explains:

...Social worlds are genuinely social units of analysis, elastic and plastic enough to allow very diverse applications. One can avoid misrepresenting collective social actors as monolithic by examining diversity within worlds, while still tracking and tracing their overall collective perspectives, ideologies, thrusts, and goals. One can comfortably analyze the world of particular individuals as important to the arena, without being limited to an individual approach. Perhaps most important, in the very framing of an arena, one is analytically led to examine the negotiations within and between worlds that are most consequential for the development of the arena over time. (Clarke, 1998, p. 265)

Within the framework of grounded theory diagrams can illustrate positions and processes and provide a visual representation of categories and their relationships; they may also be used to plot the relative strength or weakness of the relationships between categories (Clarke, 2003, 2005). Clarke's (2005) approach was devised to form a substantive theory of action; within this investigation diagramming

was used extensively as a tool with which to collate, conceptualise, analyse, represent and present data and findings from the study; the outcome in this case was the construction of a substantive theory. A substantive-level theory is a low-level theory that is applicable to immediate situations. The theory evolves from the study of phenomena situated in one particular context (Glaser & Strauss, 1967), which in this case related to learning in groups within an online course. This form of theory is differentiated from theories of greater abstraction and applicability, called midlevel theories, grand theories or formal theories. While a substantive theory can be constructed from a comparative analysis between or among groups in a substantive area, a formal theory would require comparative analysis among different kinds of substantive cases (Glaser & Strauss, 1967).

The role of the researcher at this stage of the analytic process is to develop a theory that accounts for the patterns of behaviour to be accounted for; a delimiting factor is that only those aspects related to the core category, if one is constructed, are included in the theory. A substantive theory can assume the form of a narrative statement (Strauss & Corbin, 1990), a visual picture (Morrow & Smith, 1995) or series of propositions (Glaser & Strauss, 1967). The theory itself is recognised as a developing entity, not a perfect product; thus it is provisional. When a discussion rather than a propositional form is presented, a sense of continuity may be conveyed and the theory is allowed to become rich, complex and dense (Glaser & Strauss, 1967). The substantive theory constructed from the results of the comparative analysis in this case study is presented as a discussion with a series of integrated diagrams and models to aid conceptualisation of the findings.

4.4.3.1.6 Constant comparative method

Glaser and Strauss (1967) identify four stages in the constant comparative method which involve; comparing incidents applicable to each category, integrating categories and their properties, delimiting the theory and writing the theory; thus the method itself encapsulates the procedures of grounded theory discussed throughout subsection .4.4.3

4.4.3.1.7 Memo writing

Memos constitute a written record of the researcher's analytic thought and although various types have been identified there is consensus that it is not the form but the process that is important (Charmaz, 2006; Corbin & Strauss, 2008). Memos vary in content, degree of conceptualisation and length and each analyst develops his or her own style for these personal records, examples of procedural memos have been included within Appendices B & C. Both memos and diagrams are considered integral parts of the analysis in grounded theory, not least because the complex, cumulative thinking of the analytic process would otherwise be difficult to keep track of (Corbin & Strauss, 2008). Diagrams constitute visual conceptualisations of data and by studying them the researcher may identify concepts that require further refinement (Corbin & Strauss, 2008). Thus memos and diagrams inherent within the constant comparative method contribute to the audit trail of the investigation. Items which constitute the audit trail in this study are identified in subsection 4.5.3.2.

4.5 The art, practices and politics of interpretation and evaluation

Qualitative research is perceived to be endlessly creative (Denzin & Lincoln, 2005), requiring "imaginative understanding of the studied phenomenon..." (Charmaz, 2006, p. 126) it is therefore artistic (Denzin & Lincoln, 2005).

Interpretations are constructed from and through engagement with participants and the process of making meaning from data is theoretical (Schwandt, 2000) and political (Denzin & Lincoln, 2005). The following subsections illuminate the art, practice and politics of qualitative research through a discussion of ethical considerations, interpretation, narration and criteria for evaluation as they pertain to this study.

4.5.1 Ethical considerations

The ethical concerns in educational research can be both complex and subtle and generally arise from sources of tension, within the research process (L. Cohen & Manion, 1994; Merriam, 1998). Each stage of the research process can give rise to ethical dilemmas as ethical issues may stem from the problem investigated, the context or site of the research, the methods of data collection, the nature of participants or the type of data collected (L. Cohen & Manion, 1994). Within qualitative studies ethical dilemmas are generally associated with the collection of data and the dissemination of research findings (Merriam, 1998). The ethical issues within a qualitative framework often stem from the relationship between the investigator and participants which differs between quantitative and qualitative research.

Lincoln and Guba (1985) identify three potential threats associated with data collection which required consideration in this study because of the dual role of the researcher and the use of observational methods. The threats included reactivity, respondent biases and researcher biases. Reactivity refers to the way in which the researcher's presence may interfere in some way with the setting which forms the focus of the study and in particular with the behaviour of the people involved; respondent bias may take various forms, ranging from being obstructive to

withholding information; while researcher bias refers to what the researcher brings to the situation in terms of assumptions and preconceptions which may in some way affect the way in which he or she behaves in the research setting. Prior to the commencement of the course two university human research ethics committees granted approval for the collection of preliminary data in the form of unstructured observations and a descriptive, reflective journal of potentially significant learning, incidents, events and interactions that may occur during the course. As part of the application, consideration was given to how the roles and responsibilities of lecturer and researcher would be fulfilled and delineated (see Table 4.5).

Table 4.5 Delineation of course coordination and research roles during course delivery

<i>Role of lecturer</i>	<i>Role of researcher (Participant as observer)</i>
To get to know, interact with and support the learning of individuals and groups within the student cohort enrolled in the communication course	To obtain first hand information by observing the online environment and interactions of the student cohort enrolled in the communication course during term 1 2006.
To observe, assist, monitor, assess and reflect upon student engagement with course content, student interaction and student learning within the course over a 12 week term	To maintain an unstructured, descriptive record of observations, interpretive ideas, personal impressions and feelings associated with student engagement with course content, student interaction and student learning during the 12 week term
To draw on previous experience, be aware of and responsive to factors that influence or may influence either positively or negatively student engagement with course materials, student interaction or learning within the course	To seek to understand the context of student engagement with course content, student interactions and learning within this course
To reflect upon and evaluate the strengths, weaknesses and effectiveness of the instructional design and teaching and learning strategies implemented within the course	To collect data that may complement or set in perspective data obtained by other means at a later date
To improve the instructional design and teaching and learning strategies within future online offerings by reflecting in and on teaching practice.	To identify teaching, learning and research questions, new or diverse, that may be asked or explored at a later date

Information sheets and consent forms were distributed to all learners enrolled in the course; therefore participants were fully aware of the researcher's dual role and

provided written consent for the collection of participant observation data. As is common practice, the observational activities of the researcher were subordinate to the researcher's role as participant (Merriam, 1998); thus within this study the role of lecturer took priority during implementation of the course. The impact of reactivity and respondent biases may have been limited by understandings of the researcher's responsibilities during the course. Moreover, the majority of data was collected retrospectively from an electronic archive of the course. Ethical approval and participant consent were also obtained prior to the collection of data on conclusion of the course. The researcher's coordination responsibilities related only to the communication course and not to any other course in which participants were enrolled. In addition, grades for the course were certified prior to the commencement of data collection from the large group; therefore there was no opportunity for the researcher to influence student results.

Threats that may arise during the process of data analysis include the potential for biased transcription and interpretation and an over emphasis on positive cases (Gibbs, 2002). Within this study, as the primary data came from electronic transcripts which were recorded during delivery of the course, the potential for transcription bias was eliminated. The threat of researcher bias during the interpretive phase of the study is discussed in the following subsections.

4.5.2. Interpretation and narration

This investigation revolved around two related processes - learner interaction and knowledge construction - specifically within diverse online learning contexts. In order to fully comprehend the phenomenon it was necessary to analyse both structure and process. In this study, the embedded units of analysis (large group, small groups and individuals) reflected the social strata of the course and provided structure for the

case. The methods of data collection and analysis - SNA and constant comparative method - provided a means to understand each process, to explore the relationship between them and to examine potential interdependences between individuals and others in online learning contexts.

Schwandt (2000) views social enquiry as a praxis between activity and theory and asserts that:

...as one engages in the “practical” activities of generating and interpreting data to answer questions about the meaning of what others are doing and saying and then transforming that understanding into public knowledge one inevitably takes up “theoretical” concerns about what constitutes knowledge and how it is to be justified, about the nature and aim of social theorising, and so forth. In sum, acting and thinking, practice and theory, are linked in a continuous process of critical reflection and transformation. (pp. 190-191)

From a constructivist perspective research findings are based on the researcher’s engagement with and interpretation of the data and reality is socially constructed; therefore there is more than one truth and truth itself is provisional (Charmaz, 2006; Denzin & Lincoln, 2005). There is a close relationship between the researcher and the setting and between the researcher and respondents in qualitative studies (Robson, 2002) such as this because there is a belief that an understanding or interpretation of people’s words and actions can be achieved only if these can be related to the wider context in which they have been used or happened (Gibbs, 2002).

The aims of this investigation and of qualitative research in general were and are to describe life-worlds from the point of research participants, to contribute to a better understanding of social realities and to highlight processes, meaning patterns

and structural features (Böhm, 2004). The role of the researcher within this study was to understand multiple social constructions of meaning and knowledge (Robson, 2002), to represent as accurately as possible individual constructions, shared or otherwise (Gibbs, 2002), and to reflect upon and acknowledge her own voice and perceptions (Denzin & Lincoln, 2005; Patton, 2002) and how they are presented within the dissertation.

There is no standard format for reporting qualitative research (Merriam, 2009), however, as it is the reader who judges whether there are enough data to support the researcher's interpretation sufficient evidence is required to persuade him or her that the findings make sense in light of the data presented (Merriam, 2002). Within constructivist grounded theory the emphasis is on understanding rather than explanation; thus the priority, in terms of presentation, is to show patterns and connections rather than linear reasoning (Charmaz, 2006). Yet, given the purpose of this dissertation, there is a recognised need to be more explicit about the analytical process and how conclusions were drawn. Within this study research findings are presented in the form of a substantive theory based on the analysis of a core category which was derived from two interdependent axial categories. The theory and the relationship between categories are presented in the form of a discussion within Chapter 5. The substantive theory constructed about learning relationships is then situated within the context of online learning and discussed in relation to two formal theories: Vygotsky's theory of development and Mezirow's theory of transformational learning.

4.5.3 Criteria for evaluation

Within a constructivist framework, the criteria for evaluating research are associated with the authenticity of the research process, the trustworthiness of the

research product, and the credibility, confirmability and transferability of data (Denzin & Lincoln, 2005). A number of strategies have been credited with the ability to enhance the dependability of qualitative research (Merriam, 2009; Miles & Huberman, 1994; Patton, 2002). Table 4.6 identifies a range of measures and provides a description of each approach and examples of the strategies utilised within this study.

Table 4.6 Strategies utilised to enhance the trustworthiness, credibility and transferability of the research findings (adapted from Merriam, 2009, p.229)

Strategy	Description	Examples from this study
Triangulation	Using multiple investigators, sources of data or data collection methods to confirm emerging findings	Data: Time, space, people Method: SNA and constant comparative method.
Adequate engagement in data collection	Adequate time spent collecting data such that the data become saturated; may involve seeking discrepant or negative cases	Subjective
Researcher's position or reflexivity	Critical self-reflection regarding assumptions world view biases, theoretical orientations and relationship to the study that may affect the investigation	See sections; 1.5, 4.2, 4.3, 4.5
Peer review / examination	Discussions with colleagues regarding the process of study Congruency of emerging findings with raw data and tentative interpretations	Discussion and document exchange with supervisors and external readers. Conference presentations (Rossi, 2007, 2008) Publications (Rossi, 2007, 2008, 2009)
Audit trail	Detailed account of the methods, procedures and decision points in carrying out the study	Researcher's journal Documentation and audio recordings of conversations with supervisors Diagrams and conceptual maps Memos (coding, category formation, theory construction)
Rich, thick descriptions	Providing enough description to contextualise the study such that readers will be able to determine the extent to which their situations match the research context and whether findings can be transferred	Determined by the reader
Maximum variation	Purposefully seeking variation or diversity in sample selection to allow for greater range of application of the findings by consumers of the research.	Large group x1 (n=20 learners) Asynchronous communication Small groups x5 (n=3-5 learners) Asynchronous communication Synchronous communication

4.5.3.1 Triangulation

Stake (2005) maintains that a case study gains credibility by triangulating descriptions and interpretations, not just in a singular step but also continuously throughout the investigation. Denzin (1997) acknowledges five different types of triangulation: data triangulation, which involves time, space and persons; investigator triangulation, which consists of the use of multiple rather than single observers; theory triangulation, which involves using more than one theoretical scheme in the interpretation of a phenomenon; methodological triangulation, which involves using more than one method; and member-check triangulation in which participants examine and confirm or disconfirm interpretations written about them. Each method has the potential to add breadth, depth and rigour to an investigation and to reduce the likelihood of misinterpretation (Stake, 2005), particularly when the phenomenon being investigated is complex (L. Cohen & Manion, 1994). Within this study both data and methodological triangulation were undertaken (see Table 4.7).

Vygotsky's theory of human development, as discussed previously, served as a point of theoretical departure; there was no intention to triangulate theory within this study. However, during the analysis it became apparent that, in addition to Vygotsky's theory, several precepts from Mezirow's theory of transformational learning were, not only relevant but also significant within this case. Discussion in respect of the theoretical implications of these findings is presented in Chapter 6.

Table 4.7 Methods of triangulation utilised within the study

Type & description of triangulation technique	Techniques utilised within this study
<p>Data triangulation</p> <p>Time – attempts to take into consideration the factors of change and process by utilising cross-sectional and longitudinal studies (cross-sectional techniques collect data concerned with time-related processes from different groups at one point in time; longitudinal studies collect data from the same group at different points in the time sequence)</p> <p>Space – attempts to overcome the parochialism of studies conducted in the same country or within the same subculture by making use of cross-cultural techniques</p> <p>Persons – uses more than one level of analysis from the three principal levels used in social science: the individual level, the interactive level (groups) and the level of collectivities (organisational, cultural or societal)</p>	<p>Data collected from weeks 1-12</p> <p>* Cross-sectional: Small groups weeks 5,7,11</p> <p>* Longitudinal: Large group weeks 2 ,6,11 Small groups weeks 5,7,11</p> <p>Communication within synchronous and asynchronous environments</p> <p>* Embedded units of analysis: Large group, small groups and individuals</p>
<p>Methodological triangulation – involves using either the same method on different occasions or different methods on the same object of study.</p>	<p>* SNA and</p> <p>* Constant comparative method (constructivist grounded theory)</p>

4.5.3.2 Audit trail

In this study the audit trail incorporated a diverse range of materials written, drawn, recorded and collated throughout the course of the investigation. Specific examples are provided within Table 4.6. Although some items may be considered unconventional, others, such as memo writing, are recognised as crucial elements within constant comparative method. Charmaz (2006) observes and advises researchers that “The methods of memo-writing are few; do what works for you” (p.80). The characteristics of memos are that they chart, record and detail all major analytical phases of the research process; in essence they “catch your thoughts, capture the comparisons and connections you make, and crystallise questions and directions for you to pursue” (Charmaz, 2006, p. 72). Based on this definition each

example identified as a component of the audit trail in this research constituted a personal memo.

4.5.3.3 Transferability

The transferability of the knowledge and findings from qualitative research is, as Table 4.6 suggests, determined by the readers of the study (Merriam, 2009). As such, the task of the researcher is to provide sufficient description to contextualise the study and to enable readers to determine the extent to which their situations match the research context and whether findings may be transferable (Merriam, 2009). As indicated previously, within this case attention was directed towards the generalisation of theoretical concepts rather than a particular population; however, the embedded case design and diverse learning contexts examined during the investigation may enhance the range and applicability of research results.

The procedures of grounded theory are designed to develop an integrated set of concepts that provide a thorough theoretical explanation of the phenomena under investigation (Charmaz, 2006). The results of coding and analysis within this study led to the emergence of a substantive theory about learning relationships in online contexts. Although there are differing expectations of grounded theory studies the criteria for evaluation requires that the theory constructed fits the data, provides a useful explanation, is relevant to the problem and can be modified by future inquiry (Glaser, 1978). Researchers of grounded theory studies should also give consideration to the credibility, originality, resonance and usefulness of their research (Charmaz, 2006).

4.6 Summary of chapter

This chapter outlined the research process, acknowledged the philosophical assumptions and theoretical perspective of the researcher and provided a detailed description of the research design. The research was situated within a qualitative framework of study. The research strategy was a case study as the investigation was structured by the bounded system of an online course and incorporated three embedded units of analysis. In retrospect, the study was acknowledged as a grounded theory study as it led to an understanding of learner-learner interaction and knowledge construction within a computer-mediated course and the construction of a substantive theory about the relationship between these two processes in online learning contexts. An effort was made to illuminate the art, practice and politics of qualitative research through discussion which linked ethical considerations, the interpretation and presentation of findings and the measures taken to enhance the trustworthiness, credibility and transferability of results from the study.

CHAPTER 5

LEARNING RELATIONSHIPS IN ONLINE CONTEXTS: A SUBSTANTIVE THEORY

5.1 Introduction

We can grasp a theory only by trying to reinvent it or to reconstruct it, and by trying out, with the help of our imagination, all the consequences of the theory which seem to be interesting and important...One could say that the process of understanding and the process of the actual production or discovery [of theories] are very much alike. (Popper & Eccles, 1977, p. 461)

A theory is more than a set of findings because it also provides an explanation about phenomena of interest (Strauss & Corbin, 1998). This chapter offers a substantive theory of learning relationships in online contexts, constructed from the integrated analyses of learner-learner interaction and knowledge construction within an online communication course.

The aim, of this chapter is to present and discuss the results of the research, thereby responding to each of the study's research questions, and to make clear the connections between categories which were developed during the study - specifically those which constitute the conditions, actions, interactions and consequences of learning relationships in online contexts. Within this case, textual communication and group interaction led to perceptions of a positive sense of place which was conducive to learner participation in collaborative learning activities, the development of open relationships among peers and a sharing, dialogic approach to learning. The actions and interactions of learners, in response to conditions within the course, promoted a sense of community, facilitated increased knowledge and understanding of self and others and led to personal and collective transformation.

Section 5.2 explains and exemplifies the development of learning relationships as a core category within the study; the section concludes with a detailed illustration of the categories and subcategories which constitute the

substantive theory. Section 5.3 describes the contextual conditions and explains their significance within this case. Section 5.4 identifies participation as an intervening condition. The content of this section is based on the analysis of how learners interact within a large, asynchronous group. As indicated in Chapter 4, the large group constituted the initial sample and provided a point of departure for theoretical sampling within the study. Section 5.5 identifies communication strategies as a second intervening condition. This section compares and contrasts the use of asynchronous communication within each of the learning groups and reports the use of adaptive measures for textual communication and protocols for group interaction. Thus this section responds to questions about how learners interact in large and small groups. Section 5.6 identifies and explains the dimensions of learning relationships and the processes of relationship development within the course. Section 5.7 discusses how learners construct and reconstruct knowledge within large and small groups. Section 5.8 and 5.9 discuss the consequences of learning relationships in online contexts, specifically the development of a sense of community among learners, knowledge and understanding of self and others within and outside the course and the personal and collective transformation which occurred as a result of learning relationships in online contexts. Section 5.10 offers a model of learning relationships in order to illustrate the concept.

5.2 Developing learning relationships as a core category

The purpose of this research was to explore and understand the processes, of and the relationship between, learner-learner interaction and knowledge construction within online learning contexts. A series of questions was formulated, based on the social structure of the case, to guide the collection and analysis of data. They were: how do learners interact and construct knowledge within a large, asynchronous

discussion group? How do learners interact and construct knowledge within small groups in asynchronous and synchronous environments? How do individual learners conceptualise interaction and knowledge construction within the context of an online course? In what ways do learner perceptions shape communication and learning in online groups? Two diverse but complementary methods were utilised to arrive at an understanding of each process and the relationship between them: SNA and constant comparative analysis. The results of the analyses led to the construction of a substantive theory about learning relationships in online contexts.

The generation of a theory (within grounded theory), generally although not exclusively, occurs around a core category (Charmaz, 2006). In this case the core category, learning relationships, evolved from two interrelated axial categories, learner-learner interaction and knowledge and understanding. These two categories were named in response to the purpose of the study and developed from data collected from the case. This approach is not uncommon and recognised within research literature (Merriam, 2009). The significance of a core category lies in its ability to link all other categories and its analytical power is derived from its capacity to convey theoretically what the research is all about. Within this case, although the axial categories offered insights about the processes of interaction and knowledge construction, separately, they could not draw the findings of the study together. Figure 5.1 provides an overview of each of the three categories; the purpose of the diagram is to illustrate the interrelated elements of the axial categories and to demonstrate the capacity of the core category to consolidate the results of the study

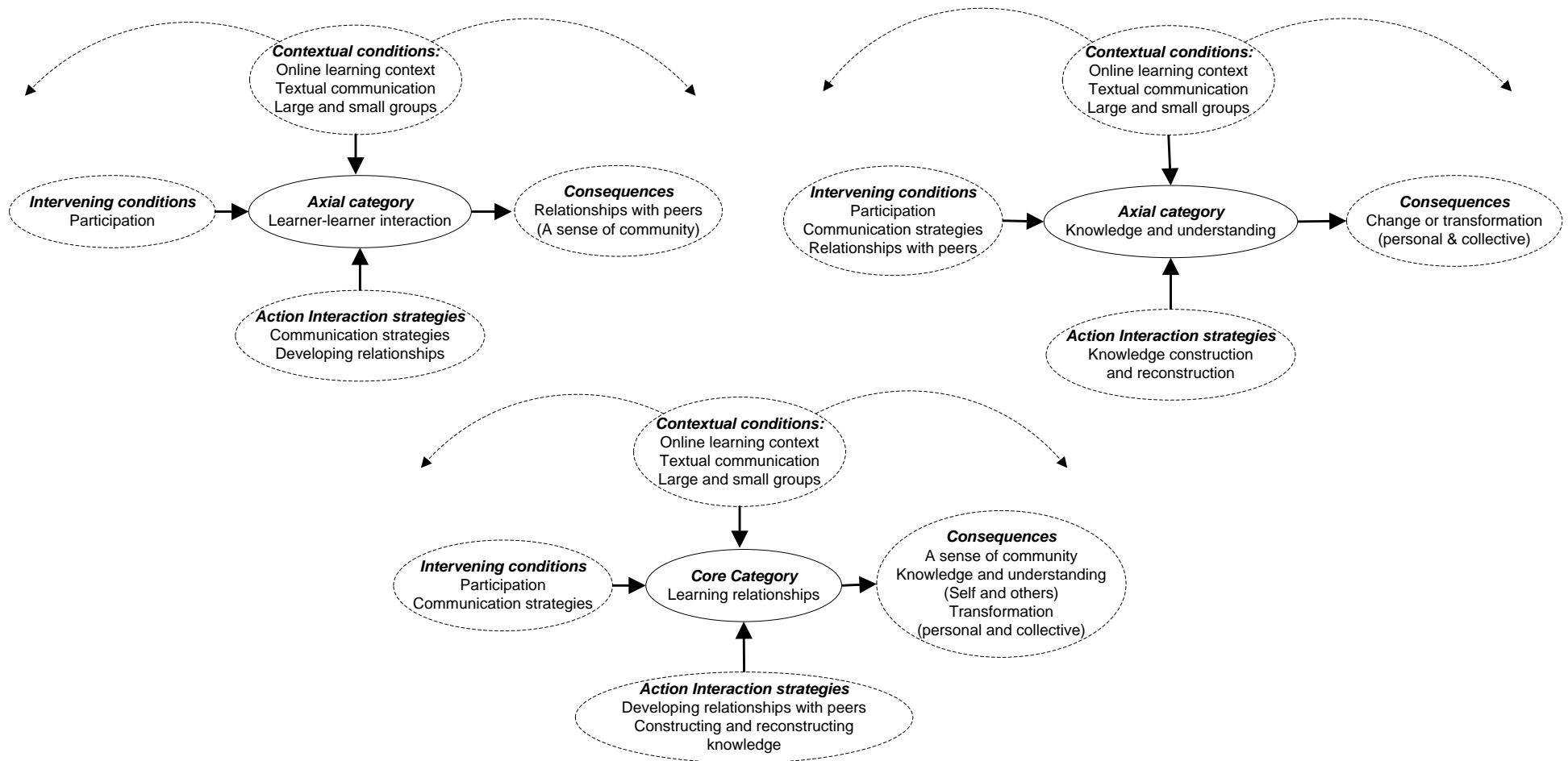


Figure 5.1 Overview of axial and core categories developed during the study

A range of diverse data was organised to illustrate the conditions, actions, interactions and consequences associated with the research phenomena. The categories and subcategories associated with learning relationships were based on the results of the SNA and developed by constant comparative analysis of learner contributions during collaborative learning activities and analysis of learner perceptions of interaction and knowledge construction in online learning contexts. In this study each method and data source provided a different perspective, which informed subsequent analyses.

SNA was described in Chapter 4 as a means of mapping and measuring relationships and flows of information between people and groups. Within this study, system logs from the Blackboard LMS, course statistics, InFlow (a computer software program) and the content of messages posted by learners to the large group discussion board were used to visualise and analyse the interactions of learners within the course. Although individually each source was able to offer insights about how learners communicated with one another, separately they could not facilitate a detailed analysis of learner-learner interaction. In addition, the efficacy of some sources differed between the large and the small groups. For example, the InFlow program was particularly useful in facilitating visualisation of the flow of information between large numbers of learners but less appropriate in small groups, partly because students utilised both synchronous and asynchronous discussion and partly because contributions to these discussions were expected to be read by all members of the small group, not by specific individuals or a particular set of individuals engaged in conversation.

Ultimately the use of a combination of sources within the large and small group analysis provided a comprehensive picture of how learners interacted within

the online course. In fact, the results of the SNA facilitated visualisation of the flow of information among learners, specifically within the large group during the course, revealed the most interactive weeks within large group and small group discussions, identified the most prominent individuals, highlighted different types of participation and forms of interaction, and exposed a range of communication strategies. The SNA also offered a methodological means of identifying and justifying the selection of a range of data (Rossi, 2008b) which were subsequently analysed by constant comparative method.

Figure 5.2 illustrates the evolution of learning relationships as a core category by providing examples of initial codes and categories which were grouped and subsequently linked to the concept. The diagram is an elaboration of Figure 4.6, presented in Chapter 4, which offered an overview of the coding procedures utilised within the study. Here the purpose is to show that the axial categories and subsequent core category were developed from and grounded in data collected from the case.

Figure 5.3 then provides a detailed overview of the categories and subcategories associated with learning relationships as a central concept and substantive theory. A range of properties and dimensions are identified within the diagram to facilitate a detailed understanding of each category and to show how it is linked to the concept. Green association lines are used to illustrate further connections between categories and subcategories and to demonstrate the complexity of learning relationships within this case.

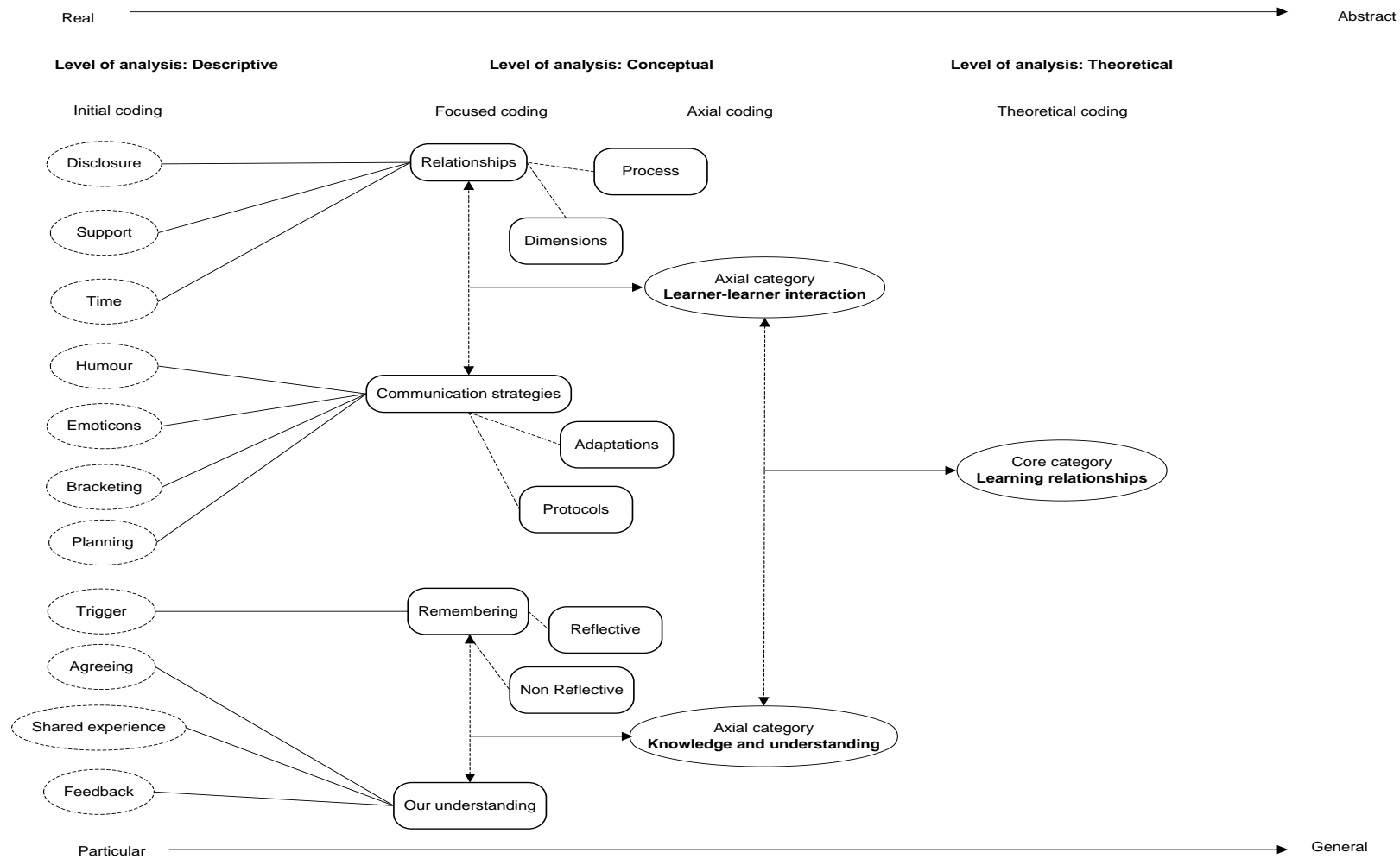


Figure 5.2 Example of category formation within learner-learner interaction (adapted from Saldana, 2009, p. 12)

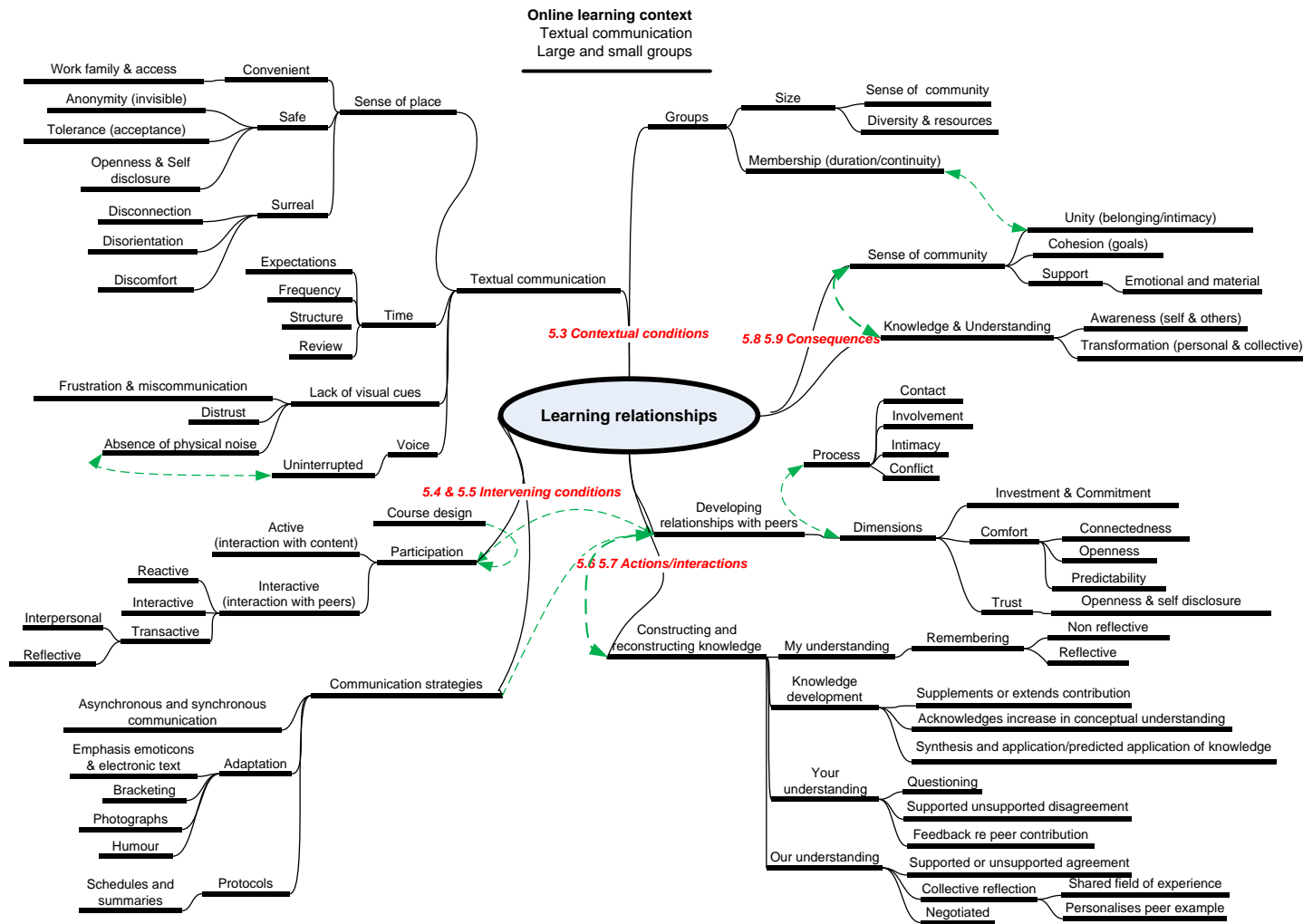


Figure 5.3 Overview of learning relationships as a core category

5.3 Contextual conditions: Textual communication and groups

The contextual conditions in this case, which were linked to the design of the course, required learners to communicate textually and to collaborate in groups of different size asynchronously and synchronously to complete learning activities. Participation was an assessable component of the course and 25% of total marks were awarded for learner participation in large group, small group and individual activities. Activities encouraged learners to reflect on personal experiences, demonstrate their understanding of the connection between experience and theoretical content and to comment, constructively, on the contribution of others, by providing reasoned rationales for their perspective (see Appendix D). The educational aim was to promote critical reflection and to expose individuals to a range of different experiences, thoughts and understandings which may enhance their learning and understanding. The marking criteria, which outlined the allocation of marks, promoted collaborative discussion and encouraged the integration of theory and references to literature within learner contributions. Of the three assessment items outlined in Chapter 4 only assessment item one was utilised to examine the relationship between learner-learner interaction and knowledge construction within this investigation as items two and three did not require learner-learner interaction.

The relationship between learner perceptions of the learning context and approaches to learning is recognised as important within extant literature (Meyer & Muller, 1990) and the findings of this study support previous research in this regard. Within this case the need to communicate textually, in groups, presented learners with a number of social and educational challenges, which led them to implement a range of self-initiated communication strategies, through these strategies learners were able to overcome many of the difficulties they encountered within the online

context. Textual communication also offered learners opportunities not available in traditional classrooms by providing a forum for uninterrupted speech, a reduction in physical noise and time to reflect, prepare and review thoughts before engaging in discussions with others. Participation in collaborative learning activities and learner-learner interaction in what was perceived to be a safe environment promoted the development of relationships among peers in different learning groups. Although the connections among members of small groups were considered stronger than those in the large group, the large group offered learners diversity and access to a wide range of resources and support. Within the online context the open, textual, relationships among peers promoted a sharing, dialogic approach to the construction and reconstruction of knowledge, the consequences of which were a sense of community, increased knowledge and understanding of self and others and examples of personal and collective transformation. In this case, the learning that occurred as the result of learning relationships was transformational.

In this course contextual conditions and learner perceptions of the online context shaped the way learners participated in collaborative learning activities, led to the implementation of communication strategies, the development of relationships with peers and had an impact on the process and outcome of knowledge construction. Consequently, explanations and discussions of the implications of contextual conditions in relation to these aspects of the theory are incorporated within subsequent sections.

5.4 Intervening condition: Participation

As participation was an assessable component of the course there was an obvious relationship between participation as a category and the teaching and learning strategies employed within the course, this relationship is acknowledged by

a green association line in Figure 5.3. The award of the greatest proportion of marks was dependent upon the content and depth of group discussion, determined by the learners' ability to analyse, synthesise and/or apply communication theory to real world situations. Students were advised that participation in weekly online discussions was compulsory, the assessment criteria emphasised that learners who did not participate in individual or group activities would receive no marks and that failure to participate on three or more occasions; that is 3 out of 12 weeks of the course could result in the award of a fail grade for the assessment item, which could subsequently result in the award of a fail grade for the course.

Although there was, clearly, an incentive for learners' to participate in weekly activities the nature and extent of the learners participation was self-determined; the criteria did not specify the frequency or length of learner contributions. Participation, as a category, was therefore, only partially determined by the course design, it exceeded the contextual conditions of the course and as a result it was recognised as an intervening condition. Based on the results of the SNA, participation was categorised as one of two types, active or interactive. Subsequent analysis of the sequence and structure of learner contributions led to the differentiation of reactive, interactive and transactive interactions.

The terms active and interactive participation correspond with different types of learner interaction within this study. As discussed and illustrated, within Chapter 2, learning, within a social constructivist framework, is perceived both an intrapersonal and interpersonal process. Figure 2.1 depicted learner-content interaction as potentially, active and interactive and learner-learner interaction to be participatory and transactive. Within educational literature collaboration was recognised as either a special kind of interaction or a process of participation in

collaborative activities. The following section explains the differentiation between active and interactive participation within this investigation.

5.4.1 Active and interactive participation

SNA provides a visual and mathematical analysis based on the way actors are connected, in order to identify underlying patterns in interactions (Scott, 2000; Wasserman & Faust, 1994). Relations between actors are illustrated as lines or links between corresponding nodes, which may be directional or non-directional (Aviv et al., 2003). Valued relations can measure the strength, intensity or frequency of the connection between actors and actors and events. Within this study data were organised into 12 networks each reflecting one academic week within the course. Nodes were created for each learner, the course co-ordinator and activities within each network. Social network data were observed at individual, small group, large group and network levels. Figure 5.4 illustrates interaction among participants and responses to the topical issue, within the large group, during week 6. Each learner has been identified by a pseudonym. Arrowheads denote the direction of the link, colour denotes differences in the strength of the link (the fewer the links the greater the strength) and the diagram shows 4 learners did not participate in the discussion; Carol, Alan, Rose & Kelsie.

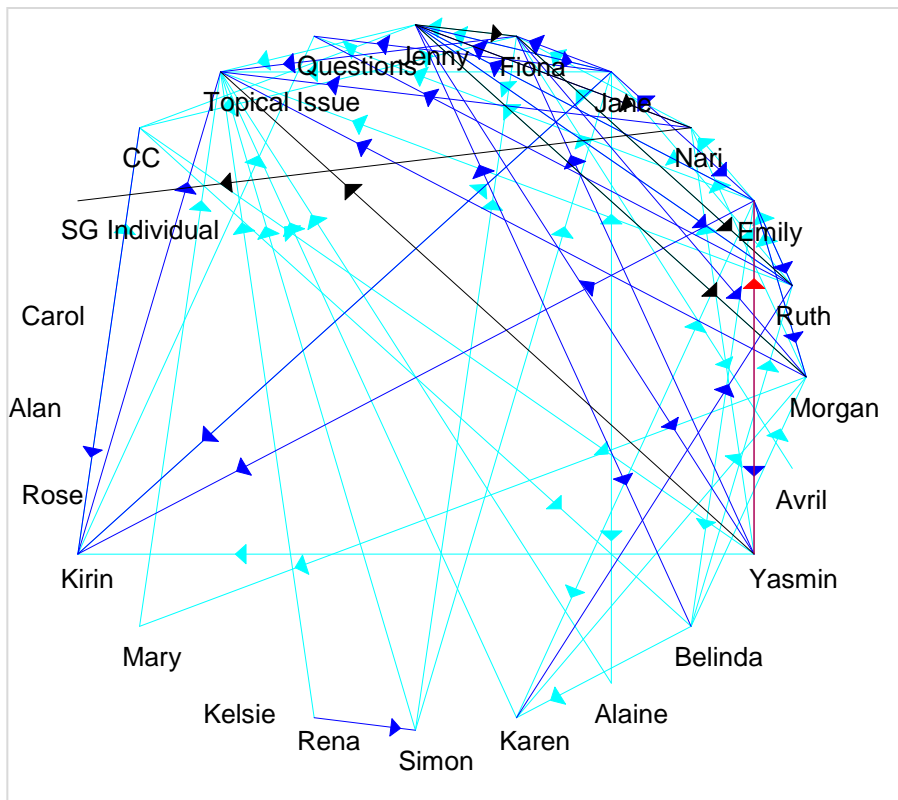


Figure 5.4 Interaction in the large group during week 6

5.4.2 Density

A social network graph can have only so many links, the maximum possible being determined by the number of nodes; density is the proportion of possible links that are actually present. Between 2 and 5 learners did not participate in large group discussions each week; a lack of participation is reflected in a graph by the absence of a link, which in turn reduces density within the network. Table 5.1 provides an overview of participant interaction and measures of density within the large group. Link strength relates to the number of messages from one learner to another or from one learner in response to the weekly activity. Throughout the course the strength of the link within the large group ranged from 1 to 4.

Table 5.1 Overview of participant interaction and measures of density within the large group

Networks	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12
Drawn nodes	26	25	23	24	24	24	24	22	24	24	26	26
Active participants	19	16	18	18	19	17	16	19	17	18	18	16
Link strength	1	1	1	1	1	1	1	1	1	1	1	1
Link count	43	35	32	51	63	46	37	52	45	36	54	47
Link strength	2	2	2	2	2	2	2	2	2	2	2	2
Link count	5	8	5	3	10	27	11	7	7	7	6	7
Link strength	3	3		3	3	3	3	3	3	3	3	3
Link count	1	1		1	3	6	2	2	1	3	1	2
Link strength		4		4		4	4				4	
Link count		1		2		1	1				1	
Potential links	552	380	380	420	462	380	342	380	380	420	506	420
Actual links	49	45	37	57	76	80	51	61	53	46	62	56
Density	9%	12%	10%	14%	16%	21%	15%	16%	14%	11%	12%	13%

- N.B. *Nodes = active participants, non-active participants and activities
 * Link strength = number of messages from one participant to another or from one participant in response to activity (value 1-4)
 * Link count = total number of actual links (includes symmetrical and asymmetrical posts)

Comparisons were drawn between data retrieved from Blackboard system logs and InFlow calculations of density. Table 5.2 shows that those weeks with the highest measures of density correspond with weeks with the highest number of posts to large group discussions; attention is drawn to this point because InFlow was not used in the analysis of small group interaction.

Table 5.2 Comparison of measures of density and number of posts to large group discussions

LGD	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12
Total posts	55	49	38	49	72	107	59	66	45	50	57	56
Density	9%	12%	10%	14%	16%	21%	15%	16%	14%	11%	12%	13%

Learner participation in learning activities was assessed weekly, from week 3 through to week 12. Assessment items two and three, which did not require collaboration, were due on Friday of week 7 and Friday of week 12 (refer to Table 4.2). Measures of density within the large group were not significantly affected by the timing of these assessments.

A subsequent analysis of the number of hits to the large group discussion board (LGD) - that is, the number of times that learners accessed the LGD - and the number of posts to the LGD revealed considerable discrepancies between the two (see Table 5.3). The analysis also illustrated the limited impact that the timing of assessment items two and three had on the number of individual contributions to discussions within the large group.

Table 5.3 Overview of learner activity and participation in large group discussions

Participant	Hits LGD	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	Posts LGD
Kirin	1223	1	1	1	1	2	5	1	3	2	1	1	3	22
Karen	841	1	1	1	1	1	2	1	1	2	1	3	2	17
Rena	2938	2	1	1	1	1	1	1	2	3	1	1	3	18
Yasmin	1098	2	0	1	1	4	11	8	3	1	3	1	2	37
Rose	353	1	0	0	1	1	0	0	0	0	0	1	3	7
Emily	2510	3	2	1	8	6	12	4	2	3	5	3	4	53
Morgan	2610	2	6	2	3	4	6	4	4	5	3	4	3	46
Jane	2916	3	2	1	2	6	12	4	11	5	9	9	11	75
Jenny	2283	1	2	4	7	11	18	8	15	6	7	6	10	95
Ruth	887	3	3	3	2	3	3	6	5	3	5	3	1	40
Simon	551	2	1	1	1	1	1	1	1	1	1	1	1	13
Carol	32	0	0	0	0	0	0	0	0	0	0	0	0	0
Alaine	2398	3	4	5	5	5	2	0	3	1	0	4	0	32
Avril	730	4	3	4	1	2	1	1	2	0	1	1	0	20
Mary	1445	2	2	1	1	1	1	0	1	1	1	2	1	14
Kelsie	820	3	0	1	1	1	0	1	3	2	1	1	1	15
CC	1889	10	15	3	4	9	6	3	1	3	1	6	1	62
Nari	1893	3	3	4	7	6	8	4	1	0	2	0	0	38
Fiona	2327	7	2	3	2	3	12	10	4	2	6	7	9	67
Belinda	1247	2	0	0	0	5	6	2	2	4	1	3	1	26
Alan	175	0	1	1	0	0	0	0	2	1	1	0	0	6
Total Hits/posts	31166	55	49	38	49	72	107	59	66	45	50	57	56	703

Without exception the number of hits exceeded the number of learner contributions to the discussion. For example, Carol accessed the LGD, reflected by 32 hits, but she did not participate in discussions within the large group during the 12 week term; thus she was active but not interactive. Alan and Rose were interactive; however, the

limited nature of their participation was reflected by few hits and correspondingly few contributions. By contrast, Mary and Rena were among the most active in terms of the number of hits to the large group discussion but these learners posted relatively few contributions to the discussion. While some learners consistently posted a single response to the LGD, others appear more interactive, based on the number of posts contributed to weekly discussions.

Beaudoin (2002) draws attention to the fact that students may “spend a significant amount of time in learning related tasks, including logging on, even when not visibly participating, and they feel they are still learning and benefiting from this low profile approach to their online studies” (p. 147). Acknowledging the absence of evidence - that indicates clearly whether online interaction enhances the quality of learning in distance education courses, or alternatively that limited interaction compromises learning, Beaudoin (2002) calls for further research in the area of the invisible learner. However, as the focus of this study was on the interactions among learners, primary interest was in visible learners.

5.4.3 Prominence

A primary use of graph theory in SNA is the identification of the “most important” or most prominent actors in the social network. Prominent actors are extensively involved in relationships with other actors and are identified through their ties or links. Two types of prominence are measurable: prestige and centrality. In directional relations those with the highest in-degree are prestigious, while those who have the highest out-degree are central. Predictably, the most prestigious nodes each week were learning activities, illustrated by the focus of posts around the topical issue in Figure 5.4. Table 5.3 shows those learners with the greatest measures of centrality each week. For example, based on the number of posts to weekly

discussions Jenny, Jane and Fiona were consistently central in large group discussions.

Together these results reveal differences in types of participation, the degree of participation, the frequency of learner-learner interaction and the strength of the connections between learners. It was not possible, however, to determine the nature of learner-learner interaction from the numerical frequency of posts and as a consequence the sequence, structure and content of learner contributions were examined in more detail.

From system logs and measures of density weeks 5, 6, 7 and 8 were found to be the most interactive within the large group. From the author's experience, this finding is typical of learner participation during an academic course and consistent with the work of Levin (2005), who has found levels of interaction to be greatest between one third and one quarter of the way through online discussions. In this study the finding indicated that a detailed analysis of the weeks of highest density may offer the greatest insights about learner-learner interaction and consequently about the relationship between learner interaction and knowledge construction within the online course. Measures of density were augmented by relational data which indicated that the greatest variation on link strength occurred in weeks 2, 4, 6, 7 and 11. As a historical perspective was sought, the analysis of transcripts from weeks 2, 6 and 11 were selected as an initial sample and analysed using the analytical procedures associated with constant comparative method. Weeks 2, 6 and 11 were also of particular interest owing to incidents that occurred in these weeks during implementation of the course.

5.4.4 Forms of interaction

Learner posts were complex as they contained multiple responses and discussion topics frequently overlapped; this made it difficult to visualise and conceptualise which sequence of posts were linked and what constituted a conversation between learners. Levin (2005) maintains that “A visual presentation of an interaction allows us to see relationships that would be difficult to see otherwise” (p. 12). In an effort to visualise interaction in synchronous discussions he introduced the concept of interactional shape defined by the width (the number of simultaneous topic threads) and the length (the number of turns in each thread). Owing to the nature of the learners’ responses within this study the application of this method was unsuccessful within the asynchronous discussions of the large group. In an earlier study Jeong (2003) tested a newly developed program called DAT to identify and follow the links between messages in discussion threads particularly links between messages which spanned multiple levels of branching sub-threads in asynchronous discussions. However, as the researcher did not have access to this program a different approach was devised.

In order to make related conversations more visible within this study, Blackboard system logs and the content of contributions to large group discussions were used to identify a series of discussion threads and conversational strings in weeks 2, 6 and 11. A discussion thread represented a subject or theme and a conversational string referred to a series of messages associated with the thread. Each post was allocated a message number and each message was organised in relation to the relevant discussion thread and/or conversation string. Figure 5.5 provides an overview of discussion threads and conversational strings in week 6. It identifies the

time span associated with each conversation and gives some indication of the topics of conversation.

Week 6 = Mon 10.4.06 - Sun 16.4.06 (participation graded Fri 14.4.06)				
Duration of conversations	Week 6	Discussion threads	Conversational strings within each thread (intial)	Conversational strings within each thread (subsequent)
Thurs 6.4.06 - Sun 9.4.06 Mon 10.4.06	Topical issue: How can effective listening and ineffective listening impact on personal and professional relationships	1	Topic suggestions: 1,2,3,4	(NT: 4) Topic clarification: 8,9,10,11
Mon 10.4.06 - Fri 14.4.06 Tues 11.4.06		2	TIR - Dual perspective: 5, 13,14,16,89	Dialogue - Dual perspective: 18,20,21,27,25,32
Tues 11.4.06 - Thurs 13.4.06				R5 - CC & L self disclosure/awareness/comm skills: 24,28,35,37,39,52,84
Wed 12.4.06 - Fri 14.4.06 Fri 14.4.06				R13&14 -self disclosure/awareness & ?: 41,47,53,73,77,85,91,97
				(NT: 18) IAR self disclosure/awareness: 99, 103
Mon 10.4.06		3	Individual activities R: 6,7,12	
Tues 11.4.06 - Wed 12.4.06 Tues 11.4.06 - Thurs 13.4.06		5	TIR: 15,19,22,46,51	Self disclosure/awareness & peer support: 29,30,31,34,36,38,44,48,54,55,67
Tues 11.4.06 - Wed 12.4.06		6	TIR: 17,33,42,49	
Tues 11.4.06 - Wed 12.4.06		7	TIR: 23,58,59	
Tues 11.4.06 - Fri 14.4.06		8	TIR: 26,92	
Wed 12.4.06 - Fri 14.4.06		9	TIR - Police comm & ?: 40,50,56,61,63,78,83,86,96	
Wed 12.4.06 - Sat 15.4.06 Wed 12.4.06		10 11	TIR & self disclosure/awareness: 43,80,93,104,106,107 TIR & self disclosure/awareness: 45,57	
Wed 12.4.06 - Thurs 13.4.06		12	TIR & self disclosure/awareness: 60,62,64,65,68,87,71	
Wed 12.4.06 - Thurs 13.4.06		13	TIE 60 - Comm skills: 66,74,76,79,	
Thurs 13.4.06 - Fri 14.4.06		14	TIR & self disclosure/awareness: 69,70,72,75,94	
Thurs 13.4.06 - Fri 14.4.06 Thurs 13.4.06		15 16	TIE 5 - Listening to children: 81, 90,95,100,101,102 TIE 69 - selective listening : 82,88	
Fri 14.4.06 - Sat 15.4.06		17	TIR: 98,105	
	Course content and resources, previous knowledge, experience and skill			

Figure 5.5 Overview of discussion threads and conversation strings from the large group: Week 6

Within the diagram conversational strings are shown to be of different lengths and some strings lead to further conversation. The first message in a sequence was responsible for initiating the conversation and Figure 5.5 reveals that for the most part initiating posts constituted a response to the topical issue (TIR), others were extensions of a previous submission or a supplementary contribution (TIE). Some posts were less effective than others at stimulating a response and/or subsequent discussion, as evidenced by those with only the initiating message and a response in the string. Learner interaction was subsequently categorised as reactive, interactive or transactive. In a reactive interaction the learner provided a single response to the topical issue or to the post of another learner; one or two learners participated and there were one or two messages in the conversational string. Messages were categorised as interactive when a learner engaged in a conversation with one or more individual/s; three or four messages were linked in an interactive string. Transactive interactions were prolonged and five or more messages were present within the conversational string. While the majority of conversational strings within Figure 5.5 were transactive, it is worth noting that not all messages in a string represented communication with others. For example, the conversational string associated with discussion thread three had three posts contributed by one individual; therefore despite the number of messages this string was not interactive.

5.5 Intervening condition: Communication strategies

Within this course, text assumed the fundamental form of an exchange and represented dialogue among learners. The analysis of large and small group discussions revealed a range of self-initiated behaviours and communication strategies developed in response to the contextual conditions of the course. As these

strategies were external to the design of the course, they were viewed as an intervening condition. This section discusses the use of asynchronous and synchronous communication in the large and small groups, the adaptations that learners made to overcome difficulties that they experienced with a textual mode of communication and the protocols that they developed for group interaction. The results, in respect of small group interaction, were based on data drawn from system logs and course statistics; as explained earlier, InFlow was not used in the analysis of interaction in these groups owing to the nature of learner-learner interactions and the use of diverse modes of communication within them.

5.5.1 Asynchronous and synchronous communication

The online course had been designed to offer learners an opportunity to communicate asynchronously and synchronously in both large and small groups. In week 2, three of the 20 learners participating in the study, together with the course co-ordinator, engaged in a real-time (synchronous) discussion using the collaboration tool afforded by Blackboard. The session lasted 46 minutes; however, it was the only occasion that members of the large group chose to utilise synchronous communication. As a result synchronous discussion was not included in the analysis of learner-learner interaction within the large group.

The use of asynchronous communication and the adoption of synchronous communication within small group networks were significantly different from those in the large group. Figure 5.6 provides a graphic overview of asynchronous communication within the large group based on the number of posts contributed to discussions during the 12 week term. The number of posts ranged from 38 to 107 and the diagram illustrates a definitive peak in week 6; lesser peaks were evident in weeks 8 and 11.

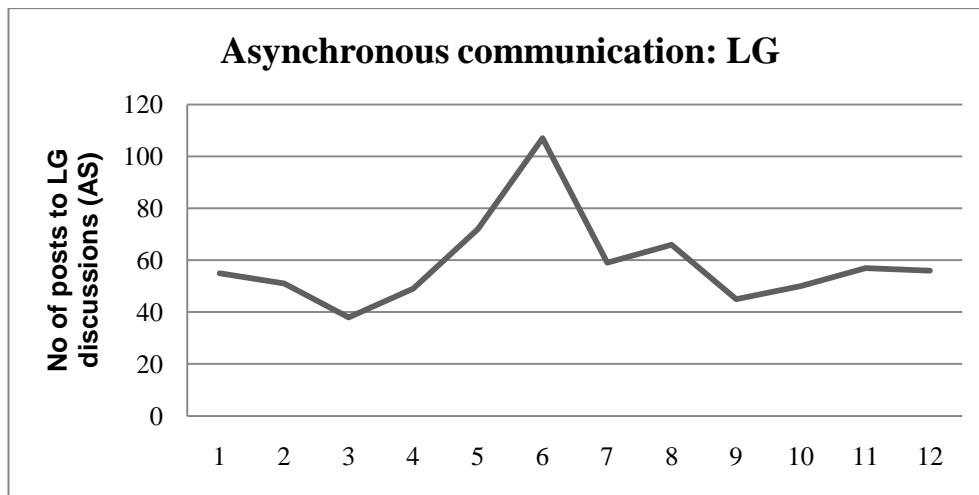


Figure 5.6 Overview of asynchronous communication within the large group

Each member of the large group was also a member of one of five small groups. Figure 5.7 provides an overview of asynchronous communication within the small groups. The number of asynchronous posts within the small groups ranged from 42 in week 1 to 161 in week 5, exceeding the range and number of contributions to the large group discussions. Similar peaks of interaction were observed in the small groups in weeks 5, 8 and 11. As discussed earlier, measures of density were greatest between weeks 5 and 8, corresponding to the weeks with the highest number of posts to large group discussions. The visual display in Figure 5.7 shows not only that density, based on the number of posts, was greater within small groups but also that higher levels of density persisted throughout the course with the number of posts dipping below 100 only three times, in weeks 1, 2 and 9.

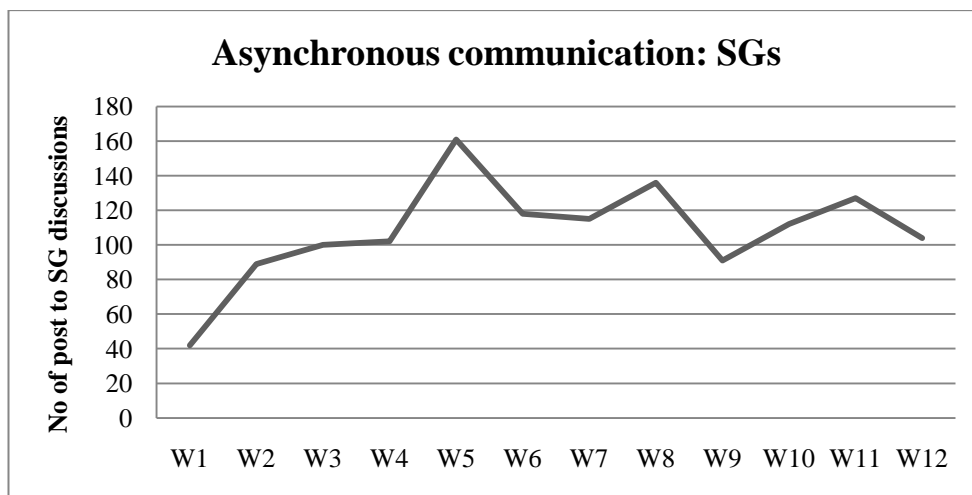


Figure 5.7 Overview of asynchronous communication within the small groups

Table 5.4 differentiates the use of asynchronous communication within each of the small groups, identifies the number of participants in each group and reveals disparity in the use of asynchronous communication between the large and the small groups. Although membership of the large group was initiated in week 1, membership of small groups was revised a number of times and was not established until weeks 4 and 5. The merging of groups and the reallocation of learners to different groups were reflected in the nomenclature of the small groups; as groups 1, 5 and 7 were subsumed by groups 2, 3, 4, 6 and 9. One learner was reallocated for a third time (upon request) between weeks 6 and 7. The reason for this learner's request for a move to another group is discussed in subsection 5.6.2.4.

Table 5.4 Comparison of the use of asynchronous communication within the small groups and the large group

Asynchronous communication	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	Total learner posts
Group 2 (n=3)	3	12	18	12	31	15	18	29	22	31	10	20	221
Group 3 (n=4)	4	11	13	14	12	5	10	10	8	4	1	5	97
Group 4 (n=5)	11	10	14	38	52	38	33	37	26	40	49	28	376
Group 6 (n=3)	16	43	29	23	55	52	34	32	19	14	38	30	385
Group 9 (n=5)	8	13	26	15	11	8	20	28	16	23	29	21	218
	42	89	100	102	161	118	115	136	91	112	127	104	1297
Large group (n=20)	55	49	38	49	72	107	59	66	45	50	57	56	703

Figures 5.7 and 5.8 and Table 5.4 provide further support to substantiate the earlier claim that the timing of assessment items two and three did not have a significance impact on measures of density, or learner-learner interaction within the course.

The comparative analysis indicates that learners were less interactive in the large group than they were in their small groups, evidenced by the number of asynchronous posts to large and small group discussions. It is clear, both textually and graphically, that group 6 and group 4 were the most prolific users of asynchronous communication in the small group discussions; by contrast, group 3 utilised asynchronous communication significantly less than the other small groups (see Figure 5.8).

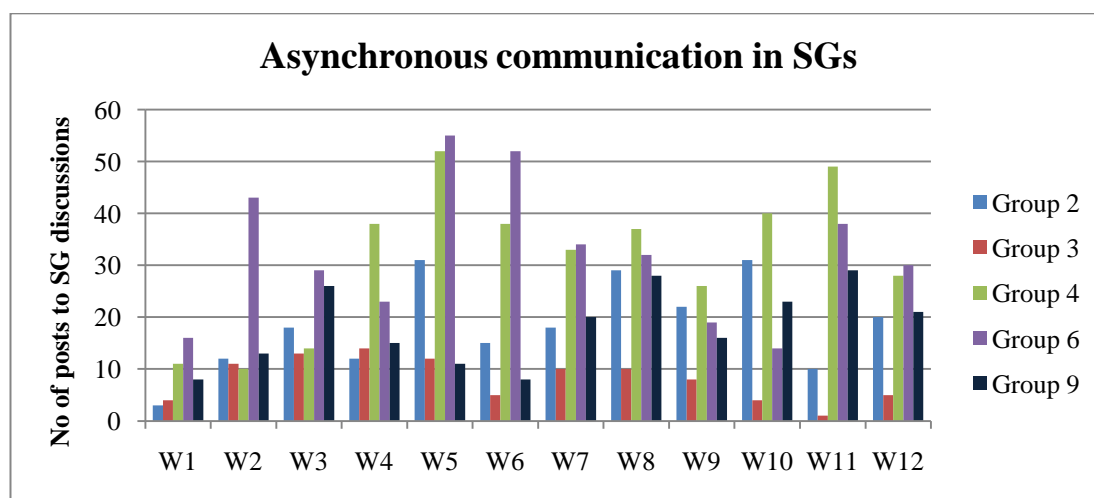


Figure 5.8 Differentiation of the use of asynchronous communication in small groups

Small groups were required to use synchronous communication during their discussions in weeks 3, 7 and 11. The request that learners use this mode of communication during the course may be important as weeks 7 and 11 indicated that learners spent a protracted length of time engaged in synchronous discussion, with no significant reduction in the number of posts submitted asynchronously. However, the

analysis also revealed consistent use of synchronous communication within small groups, throughout the 12 week term. Figure 5.9 illustrates differences in the use of synchronous communication by the small groups and shows that; while the members of group 6 were consistent in their use of synchronous communication the members of group 9 utilised this form of communication least during the course.

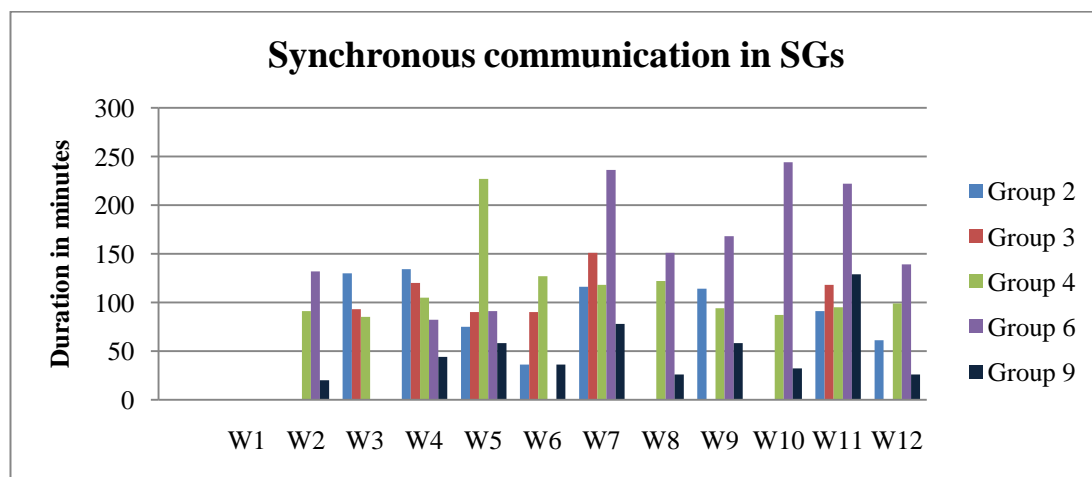


Figure 5.9 Differentiation of the use of synchronous communication in small groups

Table 5.5 indicates, where known, the number of minutes that each group spent communicating synchronously. Black zeros indicate that no synchronous session took place; red zeros indicate that a session took place but that the duration of the session was not recorded.

Table 5.5 Comparison of the use of synchronous communication within small groups

Synchronous communication	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	Total minutes
Group 2 (n=3)	0	0	130	134	75	36	116	0	114	0	91	61	757
Group 3 (n=4)	0	0	93	120	90	90	151	0	0	0	118	0	662
Group 4 (n=5)	0	91	85	105	227	127	118	122	94	87	95	99	1250
Group 6 (n=3)	0	132	0	82	91	0	236	151	168	244	222	139	1465
Group 9 (n=5)	0	20	0	44	58	36	78	26	58	32	129	26	507
		243	308	485	541	289	699	299	434	363	655	325	4641

At this juncture, it is important to note that group 3 chose to conduct synchronous sessions using MSN rather than the collaboration tool afforded by

Blackboard; their decision is commented upon in discussion of the development of protocols for small group interaction later in this section. The group's preference contributed to the absence of data as learners did not always indicate the dates and times of synchronous discussions. Interestingly, the members of group 3 did comply with the request to use the Blackboard collaboration tool in weeks 3, 7 and 11. Additional data loss can be attributed to learners participating in but failing to record synchronous sessions within Blackboard. Although there was a lack of integrity in the data collected, groups 6 and 4 were also found to have spent the most time engaged in synchronous communication.

Comparisons were also drawn between the use of asynchronous and synchronous communication within each small group. Asynchronous communication was measured by the number of posts to weekly discussions and synchronous communication was measured by the duration of synchronous communication sessions (see Figure 5.10). This decision was due primarily to differences in the nature of the messages posted via the two modes of communication. Asynchronous messages were considerably longer than those submitted synchronously and each mode appeared to serve different functions; these aspects are examined further in subsection 5.5.3 which discusses the protocols developed for group interaction. Figure 5.10, reveals differences in the use of asynchronous and synchronous communication by the small groups.

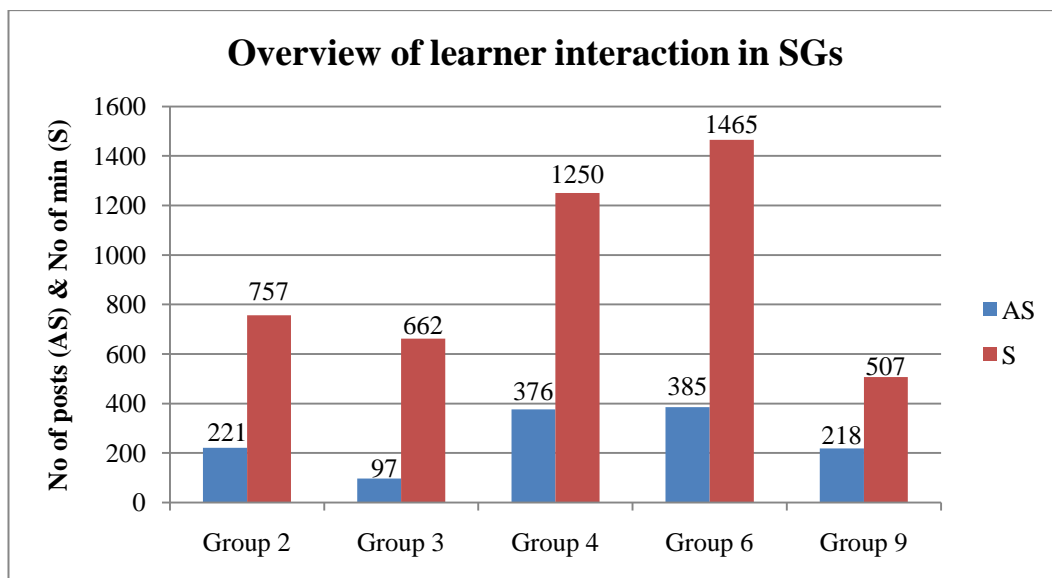


Figure 5.10 Overview of learner-learner interaction within the small groups

Jenny, Fiona and Jane were identified as the most consistently prominent in large group discussions. Those most consistently prominent within small group discussions were Jenny (G2), Rena (G3), Mary (G4), Emily (G6) and Morgan (G9). Of the three students most prominent in large group discussions, Jenny was the only learner to retain a central role within the small group setting. Although Fiona continued to be central in small group discussions throughout the term, she changed groups three times; thus her prominence is not reflected in group statistics. It is also noteworthy that between weeks 3 and 6 Fiona, Emily and Jane constituted three of the four members of group 6. The conflict that occurred within this group, attributed in part to the prominence of multiple individuals, is discussed in section 5.6.2 in connection with the dimensions of learning relationships.

Section 5.4 identified and discussed differences in types of participation, the degree of participation, the frequency of learner-learner interaction and the strength of the connections between learners within the large group. Comparisons within this section drew attention to differences between learner-learner interaction in the large

and small groups –specifically that: the number of individual contributions to small group discussions exceeded those contributed to large group discussions and as a result density in small group discussions was greater than in the large group discussions; those prominent within the large group were not necessarily central in small group discussions, and unlike the large group the majority of the small groups were consistent in their use of synchronous communication, even although they were required to utilise this mode of communication only three times during the term. The results also indicated that certain groups exhibited preferences for a particular mode of communication.

Learner contributions to online discussions are referred to frequently within subsequent sections of the dissertation, where cited learner comments are reported verbatim and documented in italics to reflect dialogue. Each learner is identified by a pseudonym and the citations indicate the week that the contribution was submitted and the group that it was submitted to. Contributions to the large group discussions are abbreviated “LGD”; contributions to small group discussions identify the small group number – for example, “SG3” and the mode of communication - that is, synchronous (S) or asynchronous (AS).

5.5.2 Adaptations for textual communication

An analysis of the content of learner posts to large and small group discussions revealed that, initially, learners anticipated that the communication principles that applied in face-to-face interactions would be transferable to the online learning context.

Fiona (W3LGD) *...The principles of communication competence still apply to this non-visual situation. Listening and expressing ideas effectively, adapting our communication appropriately, engaging in dual perspective and committing to effective and ethical communication remain crucial to the process. Divulging personal information on-line has the same amount of risk attached to it and the 10*

stages of relational development are still applicable. The slow process of building trust in the other person doesn't change...

Participants subsequently recognised textual communication as a challenge, one which contributed to their workload owing to the time, effort and creativity required to communicate effectively in online contexts.

Emily (W8LGD)...*Groups take time to deliberate about alternative courses of action. It takes a substantial time for each person to describe ideas, clarify misunderstandings and respond to questions or criticisms...*

Jane (W8LGD) ...*Trying to work out ways to communicate effectively, online, is a task on its own let alone the work we actually have to do for this course.*

Learners expressed frustration and identified difficulties documenting thoughts and feelings. Many offered examples of miscommunication and misunderstanding as a result of textual communication within and outside the course and there was general consensus that the majority of the problematic issues stemmed from the absence of non-verbal or visual cues.

Karen (W8LGD) ...*Trying to write exactly how you feel is difficult and can be taken out of context easily.*

Emily (W8LGD)...*I have found working in a group in an online environment very challenging. I love the social aspect of having a group with common goals, but find communication online to be a little frustrating and sometimes hard to understand. Miscommunication happens so easily, whether due to spelling mistakes, the inability to place emphasis on specific words to enhance understanding, or the inability to use nonverbal behavior to communicate meaning such as a joking comment...*

A number of learners also acknowledged a lack of trust and difficulties developing online relationships, particularly with individuals they had no prior association or connection with. It is, however, important to note that these concerns did not hold true for members of their small groups.

Alan (W3LGD) ...*I regard traditional face to face interaction and relationships as more trustworthy and rewarding. Online interaction may in some instances be that*

way but there is always the chance of people portraying counterfeit and bogus identities to deceive people...

Ruth (W3LGD) *...To me it would be hard to get to know someone on the net, as even though the people are doing a fair bit of disclosure, you don't know if it is truthful or not. Trust would be a big issue as you wouldn't get the non-verbal feedback, which is what I look for when talking to people...*

Emily (W3LGD) *...I personally would find it difficult to totally trust anyone I met online unless I felt that they had nothing to gain by lying to me, as with my group. I rely heavily on eye-contact, body language and verbal factors which allow me to trust when communicating with others, all of which are absent in online discussions...*

Constant comparative analysis of learners' contributions revealed a range of self-initiated strategies which included: the adaptation of text to convey non-verbal communication, specifically the use of bold text, capitalisation and/or emoticons; the use of photographs as a means of introduction or to provide an image of themselves in an otherwise textual environment; the use of brackets to contextualise content within a post and the use of humour, which was frequently used to limit or reduce the potential negative impact of a particular comment. These strategies appeared to have been initiated in order to overcome the difficulties the learners experienced within the non-visual setting; the comment below illustrated the effectiveness of the measures that the learners employed within the course.

Jenny (W8LGD) *...What I find interesting about the online group is the ability for emotion to still come across even though we cannot see the nonverbal language. We also have a couple funny characters in our group who help to alleviate the seriousness of the tasks and amount of work involved. There have been a couple of incidences of miscommunication that have caused some poor feelings but through constructive discussion the poor feelings went and were replaced with connection and unity...*

Although the focus of learner concern related predominantly to the lack of non-verbal cues, this aspect of the learning context also afforded features and

opportunities not available within face-to-face settings. For example Fiona pointed out that the lack of visual cues reduced physical noise.

Fiona (W3LGD) ...*There are distinct advantages to communicating online because the noise factors are reduced through lack of physical/environmental interference to the "conversation". Visual and non-verbal distractions are non-existent allowing a clearer, uncomplicated climate for discourse.*

Her perception was corroborated by a subsequent discussion among members of SG6 in week 8, evidenced by their contention that the absence of visual cues in online contexts had a positive impact upon interactions with others.

Emily (W8SG6-AS) from summary of small group discussions ...*We discussed whether people are initially judged by their appearance. It was agreed that physical appearance creates an initial reaction or prejudgement, which can adapt over time with experience of a person. From the discussion about physical appearance, tone of voice, and personal knowledge of a person, it was said that online discussion is positive in the sense that because this knowledge is removed from the picture we have created an unbiased situation in which we do not judge others based on appearance or non-verbal behaviour...*

Noise is recognised to have a potentially detrimental effect on communication (DeVito, 2004; Wood, 2004). It is possible that its absence in online learning contexts may enable learners to focus on learning activities and what is being said rather than be distracted by physical and/or psychological interference.

5.5.3 Protocols for group interaction

From a teaching perspective the time that learners were anticipated to spend on their studies each week and expectations in relation to learning objectives, learning activities and learning outcomes were documented in the form of guidelines, assessments and assessment criteria within the course profile. The suggested study commitment for the course in this case amounted to 12 hours per week, typical of an undergraduate course with a value of 6 credit points. The analysis of learner

contributions revealed some disparity between institutional expectations and learner perceptions of the time necessary to meet the requirements of the course.

Kirin (W8LGD) *...An online learning group is a great way to learn, but I think there is a bit too much expected of us (that's uni for you though). If this was the only subject being studied it wouldn't be an issue, but for those that are doing 2, 3 or even 4 subjects it is a struggle...*

Fiona (W8LGD) *....this online course FORCES students to contribute, participate and voice their opinions and for that reason I think it's very good....The weekly effort and progressive marking in this course replaces the final exam so naturally more effort has to be expended by students along the way during the 12 weeks*

Emily (W11LGD)*... I have enjoyed the interactions using this type of medium but have found that I do have to spend a lot of time on the computer to satisfy the requirements of this course.*

Learners considered time to be of the essence and the analysis of transcripts from small group discussions revealed that in addition to the guidelines contained in the course profile learners developed a range of protocols which provided structure for interaction and collaboration within small group contexts. Separately each group established clear procedures which required individuals to be prepared, to collaborate and to fulfil certain roles and/or tasks within a given timeframe. In effect learners created time constraints for themselves in order to complete small group activities and meet small group goals. It is notable that the protocols developed within small groups were without exception perceived to be of considerable value to the effective functioning of the group, yet concerns about the time required to complete the learning activities were associated with institutional expectations.

Alaine (LGDW8)*...The opportunity to interact as a group in our online learning environment has been a very valuable part of the study process. The group norms, established by our tutor and then further established within our small group of having clearly defined set tasks and deadlines to complete these has been a factor in the groups efficiency*

Mary (W8SG4-AS) *...Right from the start we set some ground rules for our group to abide by. We have been flexible when necessary and all of our members have a*

good understanding of what is expected is this group. We confer with each other about when is a suitable time to collaborate and set a time. We have rules about who is doing the summary. A practice summary is also expected by Thursday (if possible). Our group has established a lot of ground rules which help us function and achieve our aims...

Morgan (W8SG9-AS) ...*Within our small group norms were established in Week Five when Alaine posted an "Action Plan" outlining the details regarding individual submissions, group summaries and the allocation of roles. This gave all group members an idea of what was expected of them and when. I found this useful and adhered to these directions in order to participate effectively as a group member...*

Rena (W8SG3-AS) ...*Our small group has developed some norms about communication. We have a meeting time (930am Wednesdays) and our discussion takes place using Messenger MSN...We also have developed norms for interaction... I think we also have a good system of acknowledging each other's ideas and responding in a supportive way...*

Some practices were, however, less explicit and less effective. Asynchronous contributions tended to be considerably longer than synchronous posts. In recognition of the potential impact of lengthy messages, some learners adopted the practice of splitting posts to make them less onerous; however, this strategy subsequently added to the volume of messages that learners were required to read, particularly within the large group. Members of the large group also had a tendency to post consecutively, submitting messages to a number of individuals and contributing to a number of different conversational strings while they were online. Although this process may have been considered a time saving strategy for the individual, it may also have contributed to learner perceptions of being overwhelmed, increasing further the volume of posts submitted to large group discussions. It is also possible that learners adopted this practice to demonstrate compliance with course requirements to engage in collaborative discussion. The finding that learners did feel overwhelmed by contributions to the large group discussions supports research by Levin (2005) who asserts that if interaction is too interactive it could overwhelm the capabilities of some learners. Although there was

no evidence to suggest that interactivity was detrimental to the construction of knowledge within this course the analysis revealed that the volume of contributions and the size of the large group had a negative impact on learner participation.

Belinda (W6LGD)... *I feel overwhelmed at times by the sheer volume of some of the class debate contributions...*

Emily (W8SG6-AS) from small group summary ...*Due to the large size of the group, opinions may get lost or not heard (read) because there are so many other opinions. This is a negative because there is a chance that even though everyone gets a say it is often swamped by the large amount of information on the group board...*

Jane (W8SG6-AS) ...*This is definitely a good example of increase in size = decrease in participation...A lot of the things that I want to say are already said ...Because I don't want to repeat what people have said I'm finding it very difficult to say what I think, hence participation in my case has decreased.*

Emily's comment drew attention to learner perceptions about being heard within the large group, while Jane expressed concern about being unable to add something new to an ongoing discussion. Although student fears, associated with the loss of voice in group settings, within online contexts, have been acknowledged in research by Smith (2008), the predominant view of learners within this course was that the textual mode of communication lead to an increase in confidence and promoted the voice of individuals who tended to be less vocal in face- to-face groups. As the comments of these participants are also relevant to a point being made about learner participation in the construction of knowledge, they are referred to again in section 5.7. By contrast, Simon associated the notion of having a voice with the decentralised pattern of communication within the large group.

Simon (W8LGD) ...*With this setup each person can say what they fell and think without being interrupted which some face to face groups operate with a centralized pattern of power that privileges only one or two members of the group/class...*

Asynchronous posts, as indicated previously, were often long, contained a range of points and frequently included responses to multiple learners; in some respects these contributions resembled a monologue, an uninterrupted form of communication supported by the asynchronous discussion board. Learners were also able to speak freely as they were unhindered by visual cues which in a traditional setting may have restricted their participation or their flow of speech. Simon's point was also significant as it raises the issue of power; although Rena was prominent within group 3, the margins between the numbers of posts that members of this group contributed to small group discussion were less than in other groups, suggesting that in other groups the prominent individual was more central and potentially more powerful. In some groups prominence negatively affected group dynamics.

In week 5 learners requested that group members refrain from using attachments as a means of contributing to online discussions. For some students concern revolved around the time that it took to download the content of the attachment; others indicated that they found attachments less user friendly and believed there to be an increased risk of downloading a virus with the attachment. Indeed, several admitted that they did not read contributions posted in this way. The number of attachments submitted diminished considerably as 16 were posted up until week 5 with only 6 being posted to the large group between week 6 and week 12. Not only did learners comply with the request from their peers, in both large and small groups but several also offered suggestions for alternative means of creating messages and posting information to the discussion board to overcome the problem. Moreover the primary reason that group 3 chose to conduct their synchronous sessions using MSN rather than the collaboration tool afforded by Blackboard was the concern of one group member who did not wish to download the software

required to use the tool. This group continued to use attachments to submit a copy of their synchronous discussion others used attachments in their small groups to provide group members with copies of readings and as a means of submitting small group summaries. The significance of this point is that it reinforces the assertion that learners individually and collectively identified difficulties within the learning context, specifically associated with textual communication and worked together in both large and small groups to devise strategies to overcome the challenges that presented.

Although the contextual and intervening conditions within this case played an important role in shaping the actions and interactions of learners within the course, the fact that learners initiated, adapted and executed communicative processes of their own is also significant, as voluntary regulation of the environment by individuals or groups is recognised as a shift in control and considered an indication of higher mental functioning within Vygotsky's theory of development (Wertsch, 1985). In this case learners not only adapted to the textual conditions of the course but they also established a range of procedures and protocols which provided them with control within the learning context. Contextual conditions and learner perceptions of the learning context had an impact on participation in collaborative learning activities. Learner-learner interaction in what was perceived to be a safe learning environment promoted the development of relationships among peers in different learning groups. The following section describes and explains the stages and dimensions of relationship development among learners engaged in the online course.

5.6 Action/interaction: Developing relationships with peers

In this case learners acknowledged a connection with others; one that was derived less from the social structure of the course and more from the relationships that they developed with peers in their learning groups. As group members they shared personal and group goals and devised strategies which enabled them to negate the challenges that they encountered within the online context; they were open with one another and disclosed information which enabled others to acknowledge both shared and diverse experiences; they invested time and effort and worked together to achieve their learning objectives and they offered and received emotional and material support which reinforced their perception that although they were distant from one another they were not alone.

Figure 5.3, presented earlier, provided a detailed overview of learning relationships as the core category within this study and illustrated links between the course design and learner participation, between participation and developing relationships and between communication strategies and developing relationships; the diagram also showed connections among subcategories, specifically between the processes and the dimensions of relationships with peers. The aim of this section is to identify, exemplify and discuss the process of relationship development and the dimensions of learning relationships and to explain the connections among associated categories.

Thus far, learner-learner interaction has been discussed in terms of different types of participation and forms of interaction, based on the results of the SNA. This analysis identified which participants engaged in collaborative learning activities, the number of contributions to discussions and the strength of links between learners and prominent individuals. It also identified connections between learner contributions as

a series of discussion threads and conversational strings. However, these findings offer little insight about the content of contributions and/or understanding of the relationships between learners.

The affiliation among learners within this study was based on enrolment in an online communication course and subsequent allocation to diverse learning groups. Relationships of all types are built, refined and transformed through interpersonal communication (Wood, 2004) and as a result they develop over time (DeVito, 2004). Although all exchanges between two or more persons are considered interpersonal (Adler & Rodman, 2003), not all relationships share the same interpersonal qualities; consequently they may be perceived to exist on a continuum with impersonal at one end and highly personal at the other (DeVito, 2004). A working relationship has been defined as “an interpersonal relationship that is task-based, *non-trivial*, and of continuing duration” (Gabarro, 1990, p. 81), thus by definition one might expect the interactions between learners to be primarily task orientated but this was not the finding in this case. This outcome was somewhat surprising for the researchers as an educator and the relational aspects of learner interactions were considered in a memo.

1/10/2008 5:04 PM Node reconstruction Interaction

Interaction seems like such an inadequate term to describe what appears to be going on among learners within the course. It does imply that there is some kind of exchange, which is to an extent reflected in previous parent nodes such as information exchange... and online socialisation... However these learners do more than that - while they recognise or acknowledge each other by referring to the posts of others they also empathise, describe shared experiences and disclose to a greater extent than is suggested by terms like exchange and or interaction. An interaction can take place between acquaintances, but you don't self disclose or necessarily empathise with an acquaintance - perhaps those who are responsive i.e. submit one post but do not pursue or continue conversations could be considered interactive but those engaging in prolonged deeper levels of interaction are more interpersonal - as such their interactions may be (considered) more relationship building and that

through this process they develop trust? - Which encourages greater self disclosure leading to greater self reflection?

5.6.1 Stages in relationship development in online contexts

Several models have been developed which illustrate a number of stages in the process of relationship development (DeVito, 2004; Knapp, 1984). These models have been devised based on interpersonal interactions and relationships formed in traditional, face-to-face contexts. Although it has been argued that traditional theories about relationship development may not be applicable in online settings (Cho, Trier, & Kim, 2005), existing tools when modified offer a means of visualising the process within online contexts. Figure 5.11 presents the adaptation of a six stage model of relationship development. The model incorporates a series of stages associated with most relationships which include contact, involvement, intimacy, deterioration, repair and dissolution; each stage is conceived to have an early and a late phase (DeVito, 2004). The two phase concept has been retained within the adapted model, as have the arching and double headed arrows which link each stage; these are intended to illustrate the cyclical nature of the process. The phases within the first three stages have, however, been modified to reflect the process of relationship development among peers within the online course. Even although the diagram presents a somewhat linear view, of the process each stage and/or phase need not occur in sequence and in this case not all learners experienced each stage and phase depicted.

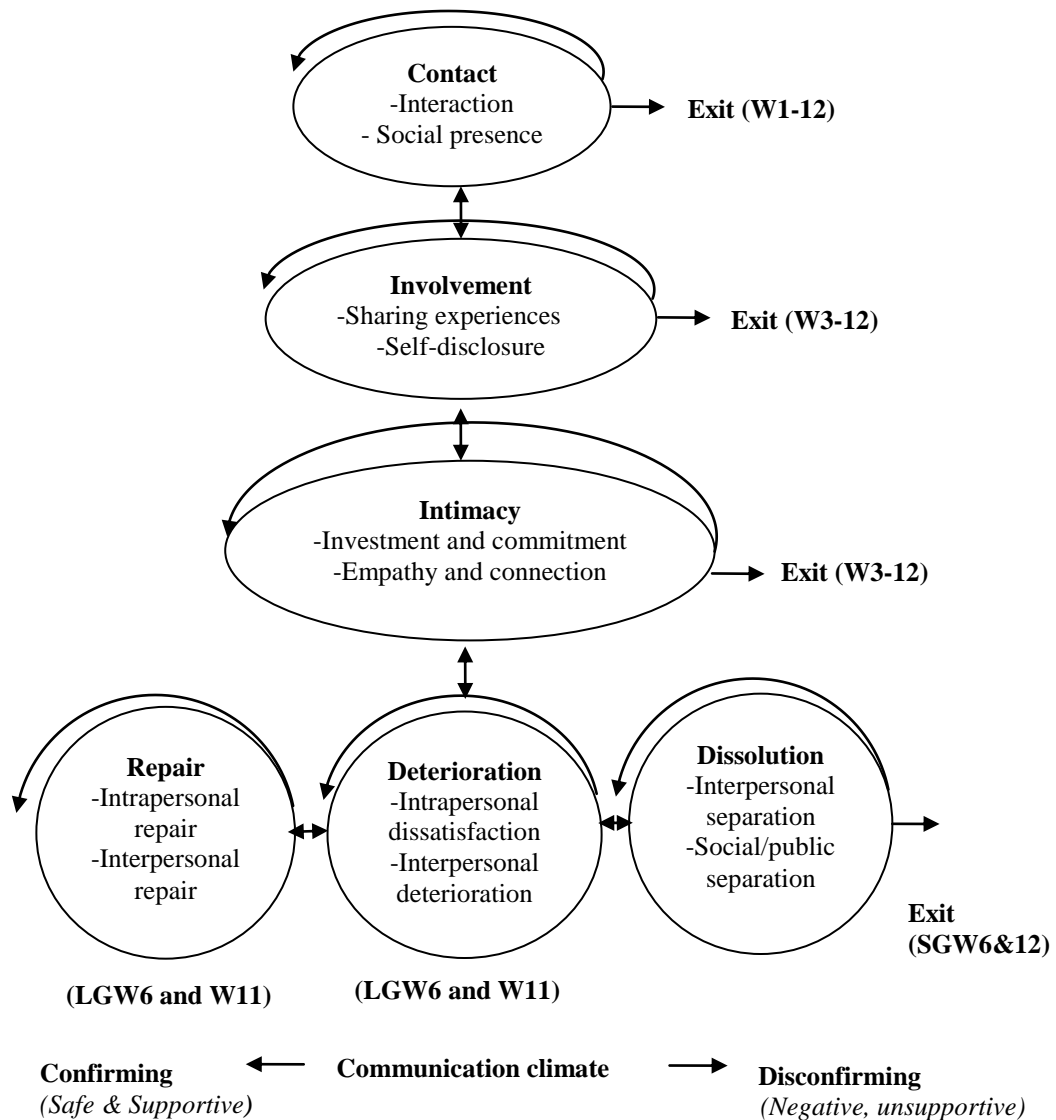


Figure 5.11 Stages of relationship development within the online course (adapted from DeVito, 2004, p. 237)

Isolated from the social structure of the course and the analyses of learner-learner interaction, it may be difficult to relate the stages in the model with the processes in an online learning context. Thus Figure 5.12 and Figure 5.13 present the stages of relationship development together with overviews of learner-learner interaction in large and small groups. The diagrams depict differences in the density of interactions between large and small groups and reflect learner perceptions of the strength of the connection that they associated with members of their small groups.

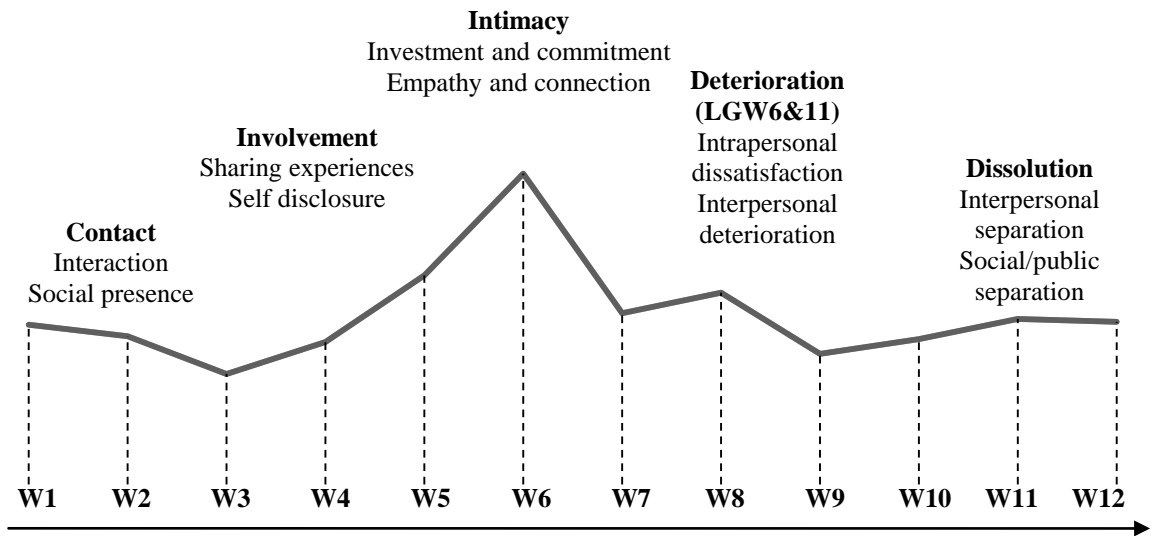


Figure 5.12 Learner-learner interaction and relationship development in the large group

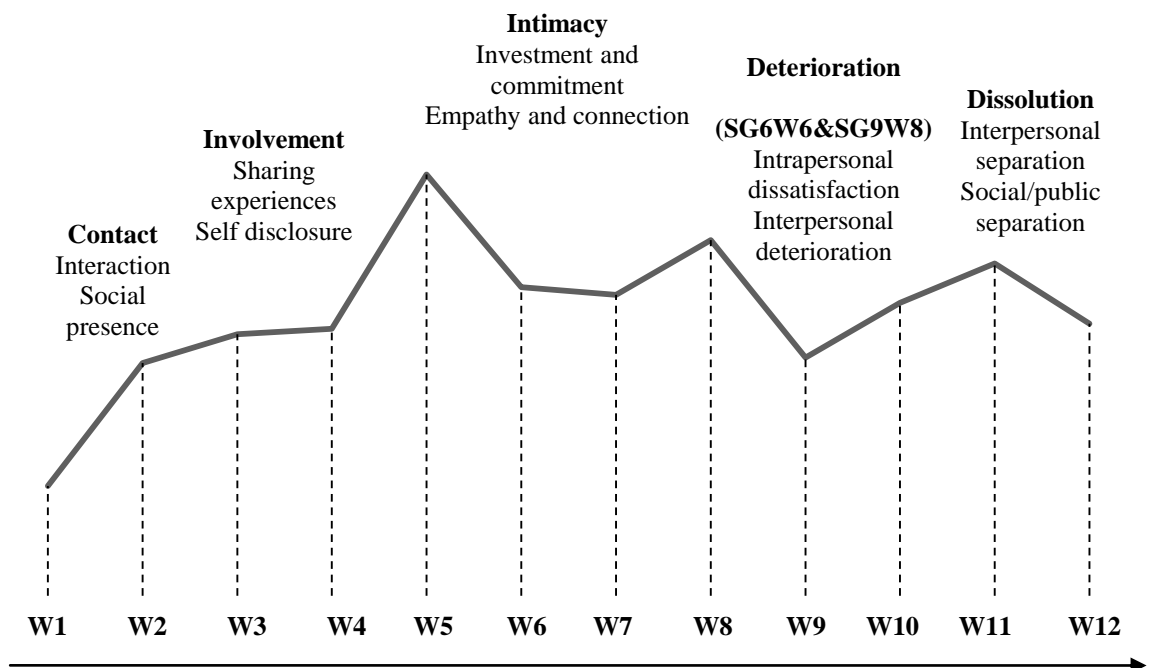


Figure 5.13 Learner-learner interaction and relationship development in the small groups

5.6.2 Dimensions of and processes in learning relationships

While it was conceptually convenient to distinguish between the dimensions of learning relationships and the processes of relationship development when developing the core category, these subcategories were in fact closely related. The dimensions of relationships with peers were categorised as trust, investment, commitment and comfort with relational dialectics. The latter is associated with the opposing but normal forces that occur in interpersonal relationships - for example, autonomy versus connection, novelty versus predictability and being open versus being closed (Wood, 2004). The stages of relationship development within the course were categorised as contact, involvement, intimacy, deterioration, repair and dissolution. The connections between the two in this case are illustrated in Figure 5.11, specifically within the stages labelled involvement and intimacy. Because of the association between the two, an integrated analysis and discussion of the development of relationships with peers is presented within the following subsections.

5.6.2.1 Contact and comfort

In the original model, within the first stage of the relationship development process, perceptual contact preceded interactional contact. This is logical, given that in face-to-face settings perceptions tend to be formed during first contact, based on physical, non-verbal cues prior to speech (DeVito, 2004). In the absence of visual cues, interaction precedes the development or projection of a social presence. The information exchanged during initial contact within the course incorporated basic socio demographic details, it was therefore low risk and in this regard exchanges in week 1 shared the characteristics of a face-to-face encounter. There is, however, a significant difference between the perceptions that may be derived from physical contact and those gleaned from a projected social presence. The difficulties experienced by

learners in this study have already been discussed, as have some of the strategies that they employed to compensate for textual communication and the absence of perceptual cues. Social presence is characterised by expressions of emotion, feelings and mood (Rourke et al., 1999), and there is potential for these emotions to be contrived in online contexts - hence the learners' reports of mistrust. Moreover, the sharing of emotion is more frequently associated with intimacy, which generally occurs considerably later when developing interpersonal relationships face-to-face. If, however the presence projected is perceived to be authentic, relationships may form more quickly in online settings.

Within this case a connection was identified between contact as a stage in the relationship development process and comfort as a dimension of learning relationships. To cite just one example, although learners appreciated the convenience and accessibility of resources and discussion boards several commented upon their initial expectations in relation to the course and expressed preferences for traditional classroom settings.

Jenny (W11LGD) *...I understand the convenience of the medium but thought it might be structured around more text book and library work, probably because that was how I studied when I was at school pre- computer days... I have actually considered ...switching to an on campus course next year...*

Learner preferences within this course not only supports Weller's finding (2007) that students have traditional expectations about the form that their education should take but also indicate comfort in the predictability of traditional learning contexts as opposed to the novelty of online contexts.

5.6.2.2 Involvement and trust

In the original model of relationship development, involvement is related to the processes of testing and intensifying connections with others. In interpersonal

relationships these phases may include initial, low risk disclosure. Within the learning context of this course the connections among learners were established through group membership and in this case involvement was demonstrated by learners who shared personal experiences and engaged in significant levels of self-disclosure. It will be recalled that in week 3 learners expressed a distrust of individuals whom they had not physically met and their concerns were related to the absence of visual cues that they normally used to gain a sense of others. However, their actions and interactions during the course contradicted the distrust that they had reported, as many engaged in high levels of disclosure early in the course.

Openness and security play an important role when establishing trust, which is based on a belief about the reliability of others; generally trust takes time to develop, but this was not the finding within this case. The reasons that emerged to explain learner behaviour were associated with their perceptions of the online learning context. On the whole, group members were perceived to pose little threat as they were seen to share common goals. Moreover, the online context was believed to offer learners invisibility, anonymity and safety and as such it was conducive to openness and personal disclosure.

Nari (W3LGD) *...I think the fact that we are all on common ground with studying similar courses and having similar career goals may enhance our ability to trust those in our class, and effectively self-disclose information.*

Jenny (W3LGD) *...I personally find it easier to self-disclose online as there is the perception that I can make fool of myself but it doesnt matter because I cant be seen...*

Yasmin (W8LGD) *... in class it is easy to be self conscious but with this environment we probably will never be in a position to meet face to face so in effect we are relatively anonymous, therefore safe...*

The learners' association between anonymity and safety is important as it supports the finding of previous research which indicates that online environments

engender openness between individuals which leads to an increased incidence of self-disclosure (Roberts, Smith, & Pollock, 2006; Rourke et al., 1999). Yet it challenges research which suggests that computer-mediated interactions may not be a sufficiently rich mode of communication to engender trust relations and that it takes time to build trust that promotes collaboration (Haythornthwaite & Aviv, 2005). Learners within this course were able to build trusting relationships within a relatively short period of time, between week 3 and 8 of a 12 week term. Moreover, given that they reported feeling less of a connection with members of the large group (see subsection 5.6.2.2) and that small group membership was not finalised for some students until week 5, learners were willing to be open with, reveal personal information and share experiences with individuals whom they did not know well and with whom they had not formed firm bonds.

That said, learners were not unaware of the nature and/or extent of their disclosure. Indeed, earlier Fiona was cited acknowledging that the risks associated with divulging personal information in online contexts was comparable with the risk in a face-to-face context. For others the affordances of textual communication were thought to provide additional security, with time to consider the wisdom of their decision to disclose.

Avril (W3LGD) *I think, for some people, it is easier to self-disclose in an online environment as you can think long and hard about what you are willing to disclose before you do it (in an e-mail situation).*

The point is that the online context was conducive to openness and self-disclosure and learners were inclined to trust members of their learning groups, particularly members of their small groups. As trusting relationships enable individuals to share information, engage in questioning discussions and achieve mutual and

consensual understanding (E. W. Taylor, 1997), they are of considerable value in collaborative learning contexts.

5.6.2.3 *Intimacy, investment and commitment*

In the original model, which was based on stages, the phases of intimacy were related to commitment and social bonding, to reflect progression as an interpersonal relationship becomes public (DeVito, 2004). In a learning context, intimacy is associated with intellectual sharing rather than physical closeness (Adler & Rodman, 2003) and the connection between learners in this case was determined initially by enrolment in the course and by group allocation. Within the course, the early phase of intimacy was associated with the investment and commitment of learners as they participated and collaborated with each other to complete learning activities. As dimensions of relationships with peers, investment and commitment were self-determined and could be ascertained from the number of posts contributed during asynchronous discussions, the time spent collaborating synchronously each week and the consistency of learner contributions in collaborative sessions or asynchronous discussions (see Table 5.3 and Table 5.4). The second phase was based on the first and was associated with expressions of empathy with and/or connection between members of learning groups.

Learners differentiated between their connections with members of the large group and members of their small groups. Invariably learner perceptions of the connections were associated with the relationships that they had with group members. The connection between learners was stronger when the relationship extended beyond meeting the needs of the task; instead it had a personal quality and learners' shared intimate knowledge of one another. Interpersonal connections between learners in small groups had a positive effect on the time that they invested and their levels of

commitment, evidenced by the statistics presented earlier and the comments of learners below.

Kelsie (W8SG9-AS)... *Although I am a member of two groups for this online course I feel I have only experienced a bonding with my smaller group with which I conduct my group activities... In this small group we have worked together and communicated towards reaching a mutual goal ... The small size of the group has allowed our communication to flow beyond our task topic and include personal information that has highlighted our differences and similarities...*

Avril (W8LGD)... *I feel no cohesion within a group this large as nothing seems personalized or related to me. There is less contribution from each member due to the large group numbers..it is not worth the effort when trying to learn in online environment's like the class discussion board...*

Kirin (W8LGD) ...*I am keeping up to date with my readings and trying to have the weekly tasks finished on time, I am putting so much effort into this subject, mainly because I don't want to let my group down...*

Although linked to investment, commitment involves making decisions to maintain connections; in interpersonal relationships these decisions are often based on perceptions about the future of a relationship (Wood, 2004). In this respect commitment is one aspect with the potential to be problematic in learning relationships because the association between learners tends to come to a predetermined end, which in this case was at the end of a 12 week term.

Emily (LGDW3) ...*although I have only been a part of my group for this subject for 3 weeks we have already established a relationship where we are comfortable and can joke around with each other. I feel that we are all committed to our relationship (for at least the next 10 weeks)...*

5.6.2.4 Deterioration, repair and dissolution

Conflict was represented within the original six stage model as deterioration of the relationship, with two potential outcomes; repair or dissolution. Although in Figure 5.11 these stages are located at the end of the development process, they may occur at

any point in the relationship. The three stages were retained within the adapted model as each was representative of the experience of learners within large and small groups.

Within the large group two incidents were observed which arose from the intrapersonal dissatisfaction of two different learners, in week 6 and in week 11. In both instances the conflict was resolved: the first occurred as a result of a misunderstanding and was resolved by an apology from one individual to another; the second was resolved through the joint effort of learners who suggested that the dissatisfied individual may have mistakenly personalised learner contributions to the group discussion. Interestingly learners offered feedback in which they rationalised why the situation had occurred, which may have had a positive effect upon the resolution but their response also indicated that they were utilising communication strategies promoted within the course, specifically; reflection, contribution and justification.

The conflicts among members of SG6 in week 6 and among members of SG9 in week 8 were by contrast the result of interpersonal deterioration. Although the phases of deterioration suggests that intrapersonal dissatisfaction may precede interpersonal deterioration in a two person relationship, this is not necessarily the case in a group situation, as within the course the conflicts that occurred within the small groups involved more than two group members and in each instance the deterioration was not repaired. The situation in group 6 occurred as the result of disagreement among several prominent individuals; in this instance the conflict spiralled and resulted in the dissolution of the relationship as one group member requested separation and reallocation to a different group. The situation in SG9 in week 8 stemmed from a perceived lack of commitment from one member of the small group.

Morgan (W8SG9-AS)... *I think a lot of our problems within our small group stem from lack of commitment, for one reason or another, from individuals...*

Morgan's assertions were supported by an analysis of the individual's participation in both large and small group activities, and the collective comments of small group members illustrate the resentment that can develop within learning groups when the investment and commitment of others are perceived to be inequitable.

Morgan (W8LGD) *...online groups are worth the effort, that is as long as all members put in equal effort. When working in any kind of group, in particular online group it is important to be aware of **social loafing**. Social loafing is "the tendency of group members to do less than they are capable of individually" (Robbins et.al. 2001. p. 289). When social loafing is evident it makes it hard for groups to function efficiently and is often the cause of many group conflicts. So I think it is an important role of all group members to "pull their weight" and contribute equally. It is also a responsibility of other members to monitor the contribution of other group members and encourage them when they are not fulfilling their role.*

Alaine (W8LGD) *...One of the group members in our small group has not participated in any group work and has been a threat to the cohesion of our group because he sees his goal of passing the subject as autonomous rather than realising that the group work of weekly summaries is a common goal that we need to share. Groups also require good communication and as he has not replied to any of my emails urging and encouraging him to be a part of the group, we are left wondering what the problem is. We have a good group in the 3 that do communicate though and thus we have been able to work around changes in our schedule due to his non-participation... when creativity and thoroughness are important the values of groups may be more important than the time they take.*

Interestingly, the learner identified as a social loafer did not contribute the least number of posts to asynchronous discussions within the group. Subsequent investigation revealed that the difference between the lowest contributor and the loafer was that the former failed to participate in two synchronous discussions while the latter failed to contribute in eight. On this basis it would appear that synchronous communication played an important role in relationship development among learners in this group. However, their response and collective behaviour demonstrate that one individual need not prevent other group members from achieving their learning goals. In this instance, learners identified "social loafing" as a negative factor within their

group. In order to achieve their aims they accepted individual and collective responsibility, they attempted to communicate with and encourage the non participant to contribute and when this strategy failed they negotiated changes to compensate for the deficit the loafer created.

The issue of social loafing raised by members of group 9 also prompted responses which suggested that it was much easier to ‘loaf’ within the large group because of the numbers within that group; essentially individuals in general and loafers in particular were perceived to be less visible within the large group context. By contrast, those prominent in discussions were clearly visible and learners acknowledged that they recognised the names of those who contributed regularly to large group discussions. Here it is important to note that Alaine also drew attention to the loafer’s preference for autonomy rather than connection, which in hindsight suggests that there may also have been some discomfort with relational dialectics within the group. Given the deterioration that occurred in group 6 as a result of conflict between prominent individuals, social loafing and prominence were recognised as opposing forces within learning groups. These two forces were found to be closely related to the investment and commitment of learners and an imbalance in these areas may have a negative impact upon group dynamics and collaborative learning outcomes. This finding is significant because it contributes to empirical knowledge about the potential impact of visible and/or invisible learners in online contexts (Beaudoin, 2002) and highlights an important aspect of the development of relationships in online groups.

While the focus of the analysis and discussion within this section has been upon the development of relationships with peers, learners were not unaware of the

positive impact that the investment of time and effort could have on learning outcomes.

Morgan (W8LGD) *...no matter what sort of learning you participate in, you will only get out of it, what you put in. The more effort you exert the more beneficial the outcomes and learning experience should be...*

Learners within this course formed relationships with peers. The processes of relationship development and the dimensions of peer relationships were closely related and differed from those formed in face-to-face environments, and an adapted six stage model was used to illustrate the development of relationships with peers in online learning contexts. Learners were inclined to associate connection and intimacy with members of their small groups rather than with members of their large group; thus the size of the group was found to impact not only on participation in group activities but also on relationships with peers. Social loafing and prominence were recognised as opposing forces in learning groups and both had the potential to cause deterioration in, and even the dissolution of, relationships with peers.

5.7 Action/interaction: Constructing and reconstructing knowledge

Discussion in this section responds to questions about how learners constructed knowledge within the online course – specifically: how do learners construct knowledge within a large asynchronous group? How do learners construct knowledge within small asynchronous and synchronous groups? The aim is to show how learners constructed and reconstructed knowledge and to explain the relationships illustrated in Figure 5.3 among the course design, learner participation, communication strategies, relationships with peers and the construction of knowledge within the course.

The educational aim and contextual conditions within this case, described in section 5.3, reflect the co-ordinator's social constructivist view of learning, which influenced the course design. As discussed in Chapter 3, social constructivists view

knowledge construction as an interpersonal and intrapersonal process; they recognise the existence of multiple realities and acknowledge the importance of prior experiences for learning (Kumpulainen & Mutanen, 2000). Based on this perspective, educators strive to create contexts where learners can reflect upon their experience and learning and share ideas, thoughts and understandings with others (Jonassen, Davidson, Collins, Campbell, & Haag, 1995). They are offered opportunities to raise questions, model, interpret and defend their strategies and ideas (Fosnot & Perry, 2005). Thus, in order to construct knowledge, learners are required to reflect upon their experience and to articulate their knowledge and understanding. Given the purpose and educational content of the course, the construction and reconstruction of knowledge within this case revolved around personal and professional communication. Based on the results of the analysis, learning, which was categorised as knowledge and understanding, was evidenced by an increased awareness of self and others, a change in perspective and/or a current or predicted change in communication behaviour.

5.7.1 Learner perceptions

In this case, the anticipated and unanticipated perceptions of learners contributed to the shape of learner-learner interaction, the development of relationships among peers and the ways that they constructed knowledge within the course. The relationship between learner perceptions of the learning context and their approach to learning has already been acknowledged; also important is the knowledge that learners may “...perceive their environment in ways that may be very different from those intended by the educators” (von Glaserfeld, 2005, p. 7). The intention within this course was to offer learners a thought-provoking, authentic learning experience, which would enable them to explore communication from personal, interpersonal and professional perspectives, to reflect upon their needs, strengths and weaknesses, and to

develop and enhance their communication skills. The results of this investigation suggest that these aims were achieved, but also reveal the focus of learner concern to be the challenges that they attributed to textual communication and the lack of non-visual cues within the online context. While some of the difficulties that learners experienced were anticipated (because of previous course evaluations), the coordinated response of learners to the challenges reported was unexpected (see section 5.5), as were the discomfort and disorientation that some learners experienced within the online context and the confidence and voice that they associated with textual, asynchronous communication.

The finding that learners perceived the online context to be disorientating and somewhat surreal was significant. Within educational literature, dislocating and disorienting and/or uncomfortable feelings are recognised as catalysts for critical reflection and transformational learning (Mezirow, 1991), and a consequence of the conditions, actions and interactions of learning relationships in this study was personal and collective transformation; the personal and collective transformation of learners in this case is discussed in section 5.9. While critical reflection was an anticipated outcome, transformational learning was not an educational goal within this course. In the following excerpts learners acknowledged their disorientation, disconnection and discomfort, drew further attention to contextual conditions and gave rise to a number of questions about the nature and impact of online learning environments.

Jenny (W8LGD) *...The other day my husband rang from work and I was really absorbed in an assignment on the computer. He mentioned the time which was midday I thought it was only 10.30 as the stopped study clock indicated. It was cool and overcast and not noticing the stopped clock and being on the computer I felt like I was in a time warp...*

Kelsie (W3LGD) *...we have become disconnected within ourselves and our natural environment.*

Jenny (W8LGD) ...*I hate sitting at the computer and being absorbed by it...When my husband is online with work or his course he doesn't hear me and when I speak to the kids they also are completely detached from reality. It is more of a detachment than if they were just reading. Now I have started my course my family are complaining about me being the same way. We have actually limited our children to half an hour a day on computer even for online study as we feel the computer is interfering with our family connectedness...*

Jenny (W8SG2-AS) ... *Ruth spoke of talking with faceless people...The online medium makes us step out of our comfort zone...*

Ruth (W8SG2-AS) *Yes I agree with you that online discussion groups take us out of our comfort zones...*

Jenny reported her perception of losing time while working online, which is intriguing given learner consensus that online interaction and textual communication are more time consuming than classroom collaboration. While there can be little dispute that mediated interaction requires more time, it is possible that learners become aware of how much time that they have spent only once they 'disconnect'. The question here is: are online contexts as deceptive in relation to perceptions of time as they are considered to be in relation to perceptions of safety? Or does the lack of visual cues in textual communication disorientate learner perceptions of time and space? Moreover did perceptions of disconnection promote the development of relationships among peers within the course? Although relevant to this discussion, the pursuit of answers to these questions was outside the scope of this study, but is certainly considered worthy of investigation at a later date.

The earlier comments of learners also suggest that while there may be agreement about the discomfort learners feel in online contexts the reasons for their discomfort may differ. For example, previously learners commented upon the challenges they associated with textual communication; others perceived the online context to be somewhat surreal; the comfort of others is disrupted by working in online groups; and Nari's remark presented below, suggested that she may be uncomfortable

with the image she has of herself based on the contributions others have submitted to the discussion.

Nari (W6LGD) *Reading all these posts is beginning to make me feel like a terrible person...*

Although neither the learners' disorientation nor their reports of transformation (see subsection 5.92) were anticipated, both are educationally significant and have important implications for the design of future online courses and the potential to promote transformational learning within them.

The absence of non-visual cues had a positive effect, encouraging learner participation in group activities and discussion. Students believed that online interaction facilitated affective expression and enabled them to assert and express themselves in a way that they could or would not in face-to-face environments. Thus textual communication strengthened the voice and increased the confidence of learners who acknowledged their reluctance to contribute openly to group discussions in face-to-face contexts.

Nari (W8LGD) *...I find that meeting online allows me to express my feelings more openly. I don't feel threatened by others opinions of me, as they cannot see my lack of confidence in my kinesics (as they would in face to face meetings) and I cannot see their non-verbal feedback to my comments, whether they agree or disagree or think i sound stupid. When I associate with people face to face, I often feel that my comments make me sound unintelligent, and I often find people talking over the top of me...*

Belinda (W8LGD) *...I am generally a shy person and do not find on-line group work any less confronting than groupwork in class.*

Although Belinda reported feeling no more confident in online groups than she did in face to face encounters she did participate in large group discussions (see Table 1) and subsequently reported enjoying her online learning experience as a result of the support that she received from group members. Hers was not an isolated case. Although Belinda was not specific about why she found group work confronting

several other learners acknowledged their concern about appearing unintelligent. From their perspective, asynchronous communication afforded them an opportunity to prepare in advance of collaborative discussion, to reflect upon content and to consider the impact of a contribution prior to posting it to the discussion board. By contrast, synchronous communication was viewed as an experience which emulated face-to-face interaction.

Fiona (W3LGD) *...Prior to putting "the words on the page" editing of thoughts into a more concise, meaningful form is possible instead of "blurting" opinions, thoughts and ideas and risking offence to the other party...*

Nari (W8LGD) *...I feel that online learning allows me to be more prepared and contribute to discussions more effectively, as I can have information and comments in relation to topics ready in a word document to enter into discussions where appropriate, rather than always having to think of comments on the spot..*

Kirin (W8LGD) *...When communicating online I can assert myself more, and I have time to think about my response and not sound like a goof, if I say something stupid because I haven't thought about it...*

Ruth (W8 SG2-AS) *... it has been the immediate group members who have boosted my confidence and made me feel that I'm not a complete idiot. I love the acceptance and support shown, the positivity within the group is great.*

While learners acknowledged that it was difficult and time consuming to document their thoughts and feelings (see subsection 5.5.2), they also recognised that the online context, textual communication and the support of their peers afforded them control, a voice and the confidence to contribute, in a meaningful way to collaborative learning activities. As previously indicated, for some learners, the size of the learning group was significant as the large group was believed to diminish the strength of their voice and the extent of their participation (see subsection 5.5.3).

Jane (W8SG6-AS) *...A lot of the things that I want to say are already said ...Because I don't want to repeat what people have said I'm finding it very difficult to say what I think, hence participation in my case has decreased...*

Avril (W8SG3-AS) ...*The size of our group is very small with only 4 participants involved. This group size allows us to contribute to the discussion more as there is less competition by other members to be heard...*

The views of learners within this study lend support to Mezirow's (2000) assertion that "Discourse is the forum in which "finding one's voice" becomes a prerequisite for free full participation" (p. 11). In this case the learning context was conducive to learners being open about and sharing experiences; they also felt safe, unhindered by verbal interruptions and non-visual distractions and supported by peers. Self-disclosure promotes understanding (Canning, 1991; Solomon, Salvatori, & Guenter, 2003) and within this course learners were inclined to trust group members, particularly in small learning groups.

Thus far the analysis has shown that perceptions of the learning context, the size of the learning group and relationships with peers play a significant role in facilitating and encouraging learner participation in weekly discussions and learning activities. The following subsections discuss associations among contextual conditions, relationships with peers and the construction of knowledge.

5.7.2 Dimensions of learning and the processes of knowledge construction

From the analysis of learner-learner interaction and participant responses to learning activities, three dimensions of learning were identified within this study. Figure 5.3, presented on p. 142, identified these dimensions as "my understanding", "your understanding" and "our understanding" and outlined the actions and interactions associated with each; development was perceived as an extension of the dimension "my understanding" and within Figure 5.3 the actions and interactions represented the categorisation and coding of individual contributions to group discussions.

Figure 5.14 reflects the learning element of the relationship between individuals and others within the course; visually it offers an extension of the researcher's conceptualisation of Vygotsky's (1978, 1981, 1986) theory of development, which was presented in Chapter 3. The diagram shows the relationship among the learning dimensions, reiterates the actions and interactions associated with each dimension and provides an overview of the interactive, collaborative processes of knowledge construction, which in this study were evident through learner-learner interaction and multiple messages and represented by conversational strings or discussion threads.

Knowledge construction has been acknowledged to involve reflection and articulation on the part of the learner; the incorporation of the results of the analysis of how learners' constructed knowledge within Figure 5.14 is an attempt to illustrate the processes of internal and social negotiation (Jonassen et al., 1995) that occurred within the course. Interaction is, as before, depicted as a dotted line in the form of an eclipse in the centre of the diagram; the illustration shows the interrelated characteristics of the dimensions and how knowledge and experience were shared and constructed. Although located under my understanding, the development of individuals can be seen to be informed by interactions with, and the knowledge and experience of, others.

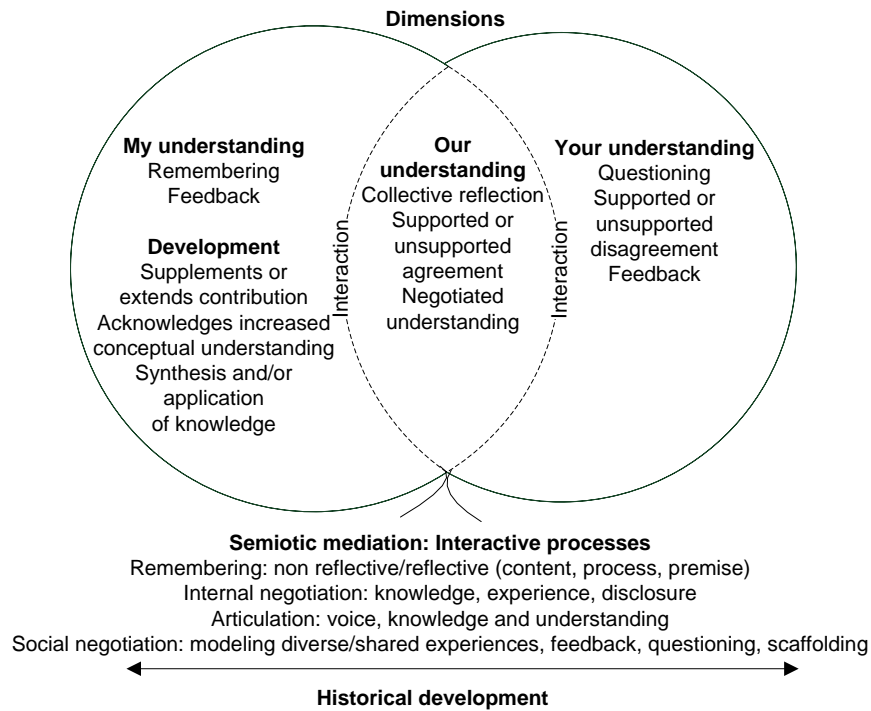


Figure 5.14 Dimensions of learning and the processes of constructing and reconstructing knowledge

The following subsections offer a description and an explanation of the processes of remembering, internal negotiation, social negotiation and articulation based on the results of the analysis of how knowledge was constructed within large and small groups.

5.7.2.1 Remembering

The dimension “my understanding” relates to the knowledge, experience and understanding of individual learners and was derived and developed from learner responses to learning activities and their interactions with others in online discussions. Within this course learners were required to engage in collaborative learning activities, to draw upon personal and/or professional examples of interpersonal communication and to discuss and demonstrate their understandings of the connections between communication theory and their experience. It is recognised that experience alone may not be sufficient for learning to take place and that structured reflection may facilitate

the learning process (Ash & Clayton, 2004; Boud, Keogh, & Walker, 1985). Although reflection was necessary within this course, learners did not receive structured guidelines. They were, however, encouraged to reflect, to share their experience and their understanding of theoretical connections with others and to provide a rationale or support for their opinions and contributions to group discussions. Although some authors argue that reflection is an independent process (Klooster, 2001), it need not be a solitary activity (Boud et al., 1985; Brandt, 2008). Within the large discussions there were numerous examples of shared experiences or incidents where learners personalised the memories of others; these were categorised as collective reflection and are discussed in subsection 5.7.2.3, which describes the dimension “our understanding”.

Learning activities served as the initial trigger for reflection within the large and small groups and learners drew from and shared a wide range of communication experiences. Learners drew examples from their interactions with family, friends, colleagues, peers, acquaintances and others. The nature of learner contributions was used as a means of determining levels of knowledge and understanding. Figure 5.3 shows that the experiences that learners remembered and shared were categorised as non-reflective or reflective. In non-reflective examples learners recounted the experience but made no connection between the experience and communication theory nor did they show that they had used knowledge of theory to inform their review of the experience. Thus the content of the post was primarily descriptive. In reflective contributions learners were able to make theoretical connections and/or evaluate or make judgements about their experience based on their knowledge and/or understanding. A rationale or support was provided for observations or assertions

about the experience recounted. This differentiation is consistent with Mezirow's (1991) distinction between thoughtful and reflective action:

Although we make tacit judgments regarding what knowledge is relevant, thoughtful action involves a selective review of prior learning rather than a deliberate appraisal or reappraisal of it; we are not attending to the grounds or justification for our beliefs but are simply using our beliefs to make an interpretation.. (Mezirow, 1991, p. 107)

Based on the content of the post, reflective contributions were further categorised as content, process or premise reflection. Mezirow (1991) points out: "We may reflect on the *content* or description of a problem ..., the *process* or method of our problem solving, or the premise(s) upon which the problem is predicated" (p. 117). In order to illustrate the differences between each type of contribution, examples of non-reflective, content reflection, process reflection and premise reflection are provided below.

The first example is a non reflective response to a small group activity in week 5; the learner remembers the incident and recounts the experience but does not relate, discuss or evaluate the experience using her knowledge of communication theory.

Kirin (W5SG2-AS) *I studied massage at TAFE [Technical and Further Education College] a few years back, and we had to practice on our class mates and one day the girl I usually paired up with wasnt there, so I was forced to pair up with this one guy, lets call him George. George looked like a garden knome, I kid you not, but that wasnt the problem. He was just creepy. He wasnt rude or anything like that but I felt like he was attending the course for things other than learning massage skills. Like I said he was creepy and I was not comfortable around him. I had to massage him first and I could deal with that, it was hard but I had to do it. It wasnt that fact that he was really hairy, I was scared of what he was thinking the whole time. Then I was to be massaged by him after lunch, and there was no way that was going to happen. For one, you have to take your top and bra off in the classroom, facing the wall with your partner holding a towel up behind you (he was about 2 foot shorter than me) and THAT wasnt going to*

happen. So I told my lecturer I was sick and had to go home and off I went, my lecturer wasn't too happy, because George had no partner to practice on and she knew I was lying. Did I do the write thing? Frankly I don't care I had to get out of there.

Although non-reflective, the contribution stimulated discussion within the small group, which prompted Kirin to review her encounter, draw conclusions and consider a course of action for future professional practice.

Kirin (W5SG2-AS) *How can we overcome these difficulties? I think remembering who you are and why you are there...I want to be a paramedic, and I'm not really going to have a choice of who I can and cannot touch...the touch issue is just something I'll have to get over if it ever becomes a problem...Some people have had traumatic past experiences which results in them not being able to be touched...the health care professional needs to find away to comfort the patient without touch...forming a bond is very important...*

Kirin's second contribution was categorised as content reflection as it related to *what* she perceived, thought, felt and proposed to act upon. By contrast, process reflection involves an examination of *how* we perceive, think or feel (Mezirow, 1991). The following examples provide evidence of learners reflecting on how they communicated with others and how they constructed and reconstructed knowledge within the course; learners regularly posted contributions that demonstrated reflection on both. Only one section of Jenny's post is presented below, owing to the length of her contribution; she did, however, introduce her example by drawing attention to effective listening skills, included an appropriate reference to literature, followed by her thoughts and reflection based on a personal example. She also discussed listening in professional settings and concluded with an explanation why she felt that listening was important (see Appendix E).

Jenny (W6LGD) *...A personal example of my lack of listening effectively occurred last weekend. My husband came to the patio where I was studiously reading chap. 6 and 7 of this week's notes and only had about 3 pages to go. He asked if anyone wanted to go for a walk. I know I glanced at him and thought to myself quickly it would be lovely for a walk but neglected to say the words as I was primarily engrossed in my work. I was*

being affected by the internal obstacle of preoccupation, my reading causing me to not listen actively. I was practising selective listening due to the family noise around me and only responded if I was addressed using my name. I wasn't being mindful of my husbands desire to organise a family outing and respectfully reply. I focused on the information and not on him causing my husband to feel disconfirmed. I didn't listen with my heart .My listening was ineffective. Active and mindful listening is hard work and I should have stopped what I was doing, given him my full attention and engaged in verbal dialogue. When I read this back to my husband he said you mean I was cranky because you ignored me and that about summed it up...

Alaine (W8LGD) *The opportunity to interact as a group in our online learning environment has been a very valuable part of the study process... Since our subject is communication it is important to be able to actually practice the concepts outlined in communication theory with each other, observing our interactions and progress... I also find that being able to work at my own pace and take my time to respond thoughtfully is a beneficial factor...Although at first I was sceptical about how well an online group would work, I was pleasantly surprised to find that overall our small group communicated well and have accomplished set tasks effectively. We have all learned from each other because through interacting we have had the opportunity to expand the concepts within the theory. We have done this by offering examples that we think relate these theories back to communication we have experienced. Our group then uses our collaboration sessions to discuss this further giving even more clarity and helping each other to grasp the concepts.*

Jane (W8LGD) *... from the group work that is involved, I am learning so much more because the thinking and analysing required is reinforcing the information, as well as applying it as we go.*

Premise reflection involves being aware of why we perceive, think, feel or act as we do and the reasons for, and consequences of, our perceptions (Mezirow, 1991).

While complex, Fiona's contribution is not atypical of posts to group discussions within the course, which is in itself significant, as one might not expect this level of reflection and insight within an undergraduate, first year course.

Fiona (W6LGD) *...Isn't it interesting what comes out of this discussion board - your father sounds like a replica of mine - totally domineering and a VERY strict disciplinarian, monopolised conversation, no interest in other's thoughts - we spoke when we were spoken to - a huge psychological problem - paranoia. The awful thing is that he didn't feel he was "missing out" on anything and that his life might have been richer if he hadn't been so egocentric and cruel. Perhaps that's why I notice other people's listening skills so much - it HURTS when people don't listen and take a little*

bit of interest and I have vivid, indelible memories of those feelings from the past. Perhaps also my past experience has made me realise how important it is to listen - even though sometimes it is hard work. It is a sign of respect and most of all, caring, for the other person, particularly if they are considered to be a fairly good friend or a child! The psychological factors governing how we listen and why would be wonderful to delve into but I guess this isn't the right forum for getting in that deep! Thanks for your comments Jenny, Regards Fiona

Fiona's example draws comparisons among learner experiences and incorporates elements of content, process and premise reflection. It also demonstrates something of the process of internal negotiation.

5.7.2.2 Internal negotiation

Jonassen et al. (1995) maintain that "We debate, wrestle, and argue with ourselves over what is correct, and then we negotiate with each other over the correct meaning of ideas or events" (p. 12), and that as a consequence the process of knowledge construction involves internal and social negotiation. However, from a constructivist viewpoint there is no correct answer or meaning; there is only an interpretation based on the knowledge, experience and understanding of the learner at any given time. In this study the notion of internal negotiation relates to the process the learner undertakes to identify an example which can be used to demonstrate, in some way, the communication principles being addressed within the course in a particular week; it also includes their selection of a personal experience which can be shared with others. Based on earlier discussions, learner's choices are likely to be determined by their perceptions of risk, associated with being open, their perceptions of safety and their trust in the recipients of the disclosure. Fiona's contribution presented in the previous subsection demonstrated her openness and her ability to undertake content, process and premise reflection. It also demonstrated the thought and consideration that she gave to the learning context and her appraisal that the large group discussion board

was not an appropriate forum in which to pursue exploration of this particular experience, even although it had been shared by another learner.

5.7.2.3 Social negotiation

As Figure 5.14 illustrates, the construction of knowledge within this case was an interactive process, one that involved negotiation by and between individual learners and others. The experiences described and reflected upon by individuals were not unique and as a result the term “collective reflection” was used; learners often reported similar experiences or shared fields of knowledge and were inclined to personalise, supplement or extend the contribution of others by sharing their own experiences and understandings of the connections between the experience and communication theory. Thus learners were able to model communication behaviour and the process and outcome of their reflection on the experience. The memo below documented the concept of collective reflection and noted an increased incidence of it within the large group, together with a greater tendency for agreement in small groups.

28/04/2009 1:02 PM Collective reflection

*Knowledge and/or experience may be shared by multiple individuals – learner may attempt to personalise the example of the other... in the large group there appear more instances of shared experience than in the small groups but I suppose that reflects the number and diversity of learners in the group. In the small groups there appears to be more agreement and elaboration. Perhaps this is due to smaller numbers in the group and the connection between members – disagreement in these groups is likely to appear confrontational and could be detrimental to relationships in the small group...
Alaine (W8SG9-AS)... I have noticed a lot of healthy conflict in the larger class discussion where people are challenging each others ideas and new opinions are formulated.*

Alaine’s comment lends support to the observation that there appeared less agreement in the large group and that questioning, disagreement and feedback could lead to a change in the learner’s original position; knowledge and understanding were socially negotiated. Learners acknowledged the educational value of having access to

different ideas, receiving feedback from others and collaborating with others to complete activities. They also indicated particular preferences in respect of asynchronous or synchronous communication, which lends support to the interpretation of findings and assertion in section 5.5.1.

Rena (W8LGD) *Our weekly group discussions are extremely valuable to broaden our ideas and understandings about a particular topic, as we 'build on each other's ideas, ..., and see new possibilities in each other's comments*

Emily (W8LGD)...*there are many advantages to working in these groups. Groups have a greater number of resources, encourage more thorough thought, have heightened creativity and enhance commitment to decisions. Working in a group exceeds my own individual capacity in terms of ideas, perspectives, experiences and expertise to be used on solving a problem. Groups are usually more thorough; an aspect of an issue one member doesn't understand another person does, details that bore one may interest another, and holes overlooked are caught by others*

Morgan (W8SG9-AS)... *I feel the large group activities are successful because there is a variety of individuals contributing on a regular basis and offering feedback on others responses...*

Emily (W5SG6-AS)...*We are trying the group discussion board as it allows for more indepth comments by each individual and also a more logical flow of discussion. We found the collaboration tool to be very disjointed with 4 members, and our thoughts and discussion was much more superficial. The new forum allows for more reference to theory and also allows us to each post our comments at a time that suits us individually.*

Alaine (W8SG9-AS) *I was surprised that a group could form and actually complete tasks to a reasonable level of proficiency in this online environment. I particularly enjoy the collaboration sessions and find by bouncing ideas off each other and sharing experiences we really open up and explore the concepts that make up our study material. I also find the larger class discussions interesting insightful and even the miscommunications can be a little entertaining if you look at it that way. The experience of being part of a study group online has been new and exciting, and has helped me to put into practice much of the theory within study materials. I will use all of the knowledge gained and am exploring these concepts within present and future...interaction.*

While learners had access to all contributions posted to large group discussions, the LMS permitted access only to the contributions posted synchronously or

asynchronously to their own small group discussions. Each week the course co-ordinator provided feedback to the class as a whole and responded individually in respect of small group activities. To promote modelling in relation to small group work, permission was sought, each week, from selected groups and exemplars of small group responses were made available to all learners. In this way learners could compare and contrast their responses with those of others. This practice was acknowledged as beneficial as it provided positive reinforcement for the students whose work was selected as an exemplar and a model for those who did not receive the positive assessment that they had anticipated.

The following extracts from a conversational string within the large group in week 6 are presented as they illustrate several points: they demonstrate how understandings were shared and negotiated; they show that learners could arrive at a different understanding of a particular concept by challenging the perspective of another; and they exemplify the learners' appropriation of the concept of adopting a dual perspective which is discussed further in section 5.9.

Fiona (W6LGD-DT2) *...Whilst studying this course I've really honed in on people's degree of ability to listen to others. It appears that many of us monopolise the conversation and impose our own ideas, judgements or feelings instead of fostering dual perspective, as suggested by Wood, J.T. (2004). We perceive and attend selectively depending on our own interests, cognitive structures and expectations... Preoccupation, prejudgement and lack of effort really stand out to me as the main factors that prevent people from listening mindfully. Listening is HARD WORK and TIME CONSUMING.*

Jane (W6LGD-DT2-CS2) *You say that people in this course in particular monopolise the conversation and impose our own ideas, judgements or feelings instead of fostering dual perspective. i think that the whole point of this course is to monopolise the conversation and impose our own ideas, judgements or feelings. We have to put our ideas down to create discussion and in this course the Lecturer wants us to analyse, discuss and debate our ideas wouldn't that mean that she wants us to NOT have a dual perspective.*

Jenny (W6LGD-DT2-CS2) *Hello Jane I agree with your point of imposing our own ideas into this forum but I think the use of debate and discussion is using dual perspective because we are still respecting others opinions and views as we do not know what life experiences lead others to have certain views or judgments. Dual perspective allows us to see the others side of the argument, use our cognitive abilities to analyse these responses which enriches our thoughts and may even cause us to soften our stance on an issue or even change our minds. I know I have done this already during the discussion of verbal/nonverbal debate. The perspective and knowledge of other members opened my eyes a little so I softened my stance on the issue even though I didn't fully agree. Regards*

Jane (W6LGD-DT2-CS2) *I agree - for some reason i thought that dual meant same (brain freeze) and you make a good point when you say that reading other opinions softens or even changes your opinion. i have found also that other opinions can also strengthen and add to your opinion as you haven't thought as laterally about it as another.*

Emily (W6LGD-DT2-CS2) *I know that you have clarified your response to Fiona but I just wanted to add a comment. You interpreted from her comments that "people in this course monopolize conversation etc", however, from rereading Fiona's comments, I think she is actually saying is that from DOING this course she has seen that others monopolize conversation (not necessarily others from this course).*

It is important to note that the question posed did not receive a response from the learner who was challenged but from others in the group; working collaboratively, learners were able to scaffold on another and negotiate understanding. Not all learners agreed that individuals were adopting a dual perspective within the course, particularly within the large group. Avril was of the view that because of time constraints learners were conforming to the expectations of the course co-ordinator. Her point was, however, disputed by a contribution from Emily which also lends support to the earlier observation that learners were more likely to disagree or challenge others within the large group.

Avril (W8LGD)...*The class tasks are time consuming and there is a real pressure for conformity (Wood 2004 p.265). The example I use to explain this is when I read other peoples responses to the class discussion. I see a lot of people siding with other people's opinion and being encouraged to do this by our lecture as it shows dual perspectives. I feel that conformity is being demonstrated rather than a dual*

perspectives as we are being graded upon our work and we simply do not have the time to disagree and create a conflict that enriches the group process (Wood 2004 p265)...

Emily (W8LGD)...*It appears that a lot of people agree that online learning groups are worth the effort. I don't know if this would be due to conformity or whether we are all just too scared to tell CC that we think it is a waste of time (lol). Personally, I know that I would not hesitate to disagree with others points of views in this online forum, and I think there are plenty of others who would be keen to debate some ideas and topics too. Maybe we just often feel the same way about things (this certainly happens in my smaller group).*

The construction and reconstruction of knowledge within the course appeared more conversational than argumentative. The following memo noted the conversational nature of learner-learner interaction, differentiated between formal and informal responses to learning activities and questioned the relationship between learner responses and the development of relationships among peers.

29/10/2008 4:17 PM Coding - learner interaction

It struck me when reviewing the content of messages in week 6 that there is perhaps a difference between the learners contributions intended as a formal response to the topical and those that are more of an interactive or interpersonal conversation with other learners - is it in these communications that learners primarily discuss shared experiences and perceptions of self and the value of learner contributions - and in the more formal response (task orientated) provide examples in which levels of understanding are more clearly demonstrated? Both types of conversation are reflective though! Both constitute learning conversations but perhaps the less formal provide the means to develop relationships with others - leading to a sense of community?

It is asserted that the most significant learning in adulthood falls into the category of communicative learning, which involves understanding, describing and explaining intentions; values; ideals; moral issues; social, political, philosophical, psychological, or educational concepts; and feelings and reasons (Mezirow, 1991, p. 75). Essentially the purpose of communicative learning is to understand what others mean and to make ourselves understood as we attempt to share ideas through speech and written words (Mezirow, 1991).

5.7.2.4 Articulation

Within this study, articulation refers to learners' ability to express themselves, their knowledge and their understanding in textual contributions submitted to group discussions in response to learning activities. Therefore although articulation can be viewed as an individual action it also relates to how learners interacted with one another, how they constructed and reconstructed knowledge and how they negotiated understanding. Aspects associated with articulation were identified and discussed in section 5.5, which described the communication strategies utilised by learners within the course. Reference was made to the absence of visual distractions, the difficulties associated with documenting thoughts and feelings, and the length of messages posted to asynchronous and synchronous discussions. Learner perceptions about the strength of their voice, their desire not to appear unintelligent and their belief that the time afforded by asynchronous communication enabled them to contribute more meaningfully to discussions were acknowledged earlier in this section. Here the aim is to explain how learners articulated individual and socially negotiated knowledge within the course.

Figure 5.5, presented earlier, illustrated discussion threads and conversational strings from the large group in week 6. The first message in a sequence was found to initiate conversation and the diagram indicated that for the most part first posts constituted a response, to the topical issue (TIR); others were extensions of a previous submission or a supplementary contribution (TIE). Initial posts tended to be longer than subsequent contributions. They frequently contained multiple examples from personal and/or professional experience and often incorporated different types of reflection. These contributions appeared to represent a formal response to learning activities. Subsequent posts were generally shorter in length and were more likely to

constitute a response to the initial post or to comments posted by others within the conversational string; these posts appeared to be less formal but more interactive and personal.

Although it was not uncommon for initial posts to include a either a reference or response to an earlier contribution, particularly when submitted later in the week, these contributions were more characteristic of a monologue. In this case, the content of these posts may have been influenced by learner perceptions of assessment requirements or by the absence of non-visual cues and the belief of learners that the use of text afforded them the opportunity to make their point after thought and without interruption. What is important is that learning conversations ensued as a result of these contributions. The procedural memo below noted that in week 11 contributions incorporating personal experiences were more likely to elicit further exchanges.

13/10/2008 11:31 AM - Learner responses

It seems that opinions even when supported by a reference are less likely to illicit further exchanges, whereas those incorporating or sharing personal experiences in relation to the topic do. For example see the singular posts of week 11 dt3,6,7,9,12, and 18 and compare with those in week 11 dt4 and potentially dt5, 14 and 16...

Learners reported using text as a means of reinforcing learning and the recordings of conversations as a reflective tool.

Jenny (W8LGD) *...I...like the medium of typing as the exercise reinforces learning for me. I have always studied by writing out my notes over and over...I also like the ability to be able to go back over recorded work and have the time to think about my work before I post it.*

Evidence that other students utilised text and contributions in a similar way can be found in previously presented extracts. Learners also acknowledged building on the ideas of others. While some conversations led learners to review the experiences that they had contributed and to reflect further than they had in their initial submissions, others led them to clarify, confirm or change their points of view. Learners were found

on occasion to respond to the contributions of others prior to submitting their own examples and understandings; therefore it was not possible to identify a sequential process for the construction and reconstruction of knowledge within the large group.

Similar trends were observed within small groups as it was not uncommon for learners to post thoughts or individual comments, asynchronously, in response to small group activities and prior to asynchronous or synchronous discussions with group members. The analysis of the processes of knowledge construction within small groups was further complicated by the fact that learners utilised synchronous and asynchronous communication, at different times and in different ways. There were, however, some commonalities; for example, synchronous contributions were short and generally limited to a sentence or an abbreviated sentence. They were also associated with immediacy and considered similar to verbal communication, but with the potential for confusion because contributions could be recorded out of conversational sequence. When viewed as a whole, synchronous discussions resembled brainstorming sessions. Small groups were inclined to schedule multiple collaborative sessions to accommodate the availability of members. The majority of procedural or organisational aspects associated with group work, such as organising collaboration times, sharing resources, or collaborating to complete the group summary were accomplished asynchronously and as indicated earlier individuals and groups exhibited preferences for particular modes of communication.

Wells (1999) differentiates between the functions of speech and text within educational contexts. While the primary function of speech is believed to be to mediate action, the function of writing is to mediate recall and reflection. Speech has the advantage of an immediate response and generally involves expressive dimensions of meaning-making, whereas documenting meaning would appear to promote

understanding. Wells (1999) asserts that, although progressive discourse involves group members in reading as well as writing, it is in writing that new ideas are brought into the ongoing dialogue and that as a result real progress can be made in knowledge building through writing because text can be reviewed, rethought and revised. It is interesting to note that previous research suggests that reflection is enhanced in online contexts because of the accessibility of transcripts, opportunities to read and reread contributions and time to compose thoughtful messages (Andrusyszyn & Davie, 1997), which lends support to Wells's (1999) point of view but offers no indication of what type of reflection was enhanced or what the outcome of that enhanced reflection was.

The analysis within this case supports the findings of previous research as reflection was enhanced but suggests that, in addition to improvement from non-reflective to reflective responses, textual communication in online contexts can enhance the learners' understandings of theoretical concepts, promote the development of relationships with peers, facilitate the advancement and application of communication skills, provide insight about communication behaviour and lead learners to change their perspectives. The knowledge and understanding that occurred as a result of learner-learner interaction and knowledge construction within this course is discussed further in section 5.9.

5.8 Consequence: A sense of community

Within the context of this course, the concept of community was based on the analysis of learner-learner interaction and knowledge construction during collaborative learning activities and supported by learner perceptions of unity, support, cohesion and belonging within online learning groups. A review of community development literature revealed that community as a construct is widely accepted as a sense rather than a tangible entity (Wiesenfeld, 1996). Although it has been argued that physical

separation reduces the individuals' sense of community and gives rise to feelings of disconnection, today the concept is considered more relational than geographical (Brook & Oliver, 2003), which is a view supported by the findings of this study.

As indicated within the literature review, there is a lack of consensus about what constitutes a learning community and as a result definitions continue to evolve in response to the diverse needs of learners and the communities in which they learn (Kilpatrick, Barrett, & Jones, 2003). Current definitional themes (Rovai, 2002), suggest that a learning community may be described as a group of individuals who share a common purpose or goal, collaborate to address learning needs and draw from individual and shared experiences in order to construct knowledge and enhance the individual and collective potential of community members. This investigation determined that learners in this case exhibited the characteristics of an online learning community and although they did not articulate it as such they were aware that the connections among them exceeded that of a learning group.

Jenny (W8SG2-AS) *I know that we are classed as a group ladies but do you think that we are evolving into a team, due to the intimate knowledge we are collecting of each other, achieving more independence as our abilities grow and not needing as much tutor help, the ability for us to co-ordinate ourselves and resolve issues to achieve the end goal and work as a unit? If we were disbanded and made to reform to other groups we would not have the cohesion required to work as well as we do.*

Jenny's comments are significant not only because they support the notion that the relationship among group members, particularly in small groups, went beyond that of a task-orientated group but also because they acknowledge the relational aspects of the bonds among group members, highlight the ability of the group to work together (without supervision) to achieve their aims and draw attention to learner perceptions that cohesion, and therein the learner's sense of community, may be adversely affected by changes to group membership. The latter view was supported by learners who

separately, discussed the negative impact that changes to group membership had within their small groups and others who revealed feeling like intruders when they joined a small group with long term members.

Nari (W8SG4-AS) *...Initially, my group was small, and we found it easy to work together and establish rules and processes within our group. However, we have had group members leave, others added, some fail to contribute on occasion, and others leave again. Since then I think it has been difficult for our group to develop strong cohesion, and work to the same rules and processes that were set within the initial group. At week 8 of term, we are now beginning to work well together, and slowly establish and commit to new rules and processes, with only few minor hiccups...*

Yasmin (W8SG4-S-C2) *I agree with the intrusive feeling with the group, I started when you did I think (2/05/2006 10:57:50)*

Carol (W8SG4-S-C2) *yeah, i felt like i was interrupting something (2/05/2006 10:58:04)*

The fact that learners did not perceive the same sense of community; unity cohesion support and belonging, within the large group as they did in their small groups, and that some learners in small groups took time to develop that sense of belonging is significant, not least because it supports research which suggests that the experience within a community is context specific (Sonn, Bishop, & Drew, 1999).

The results of this study also lend support to the suggestion, articulated in Chapter 2, that the concept of learning communities could be viewed as a social constructivist means of reducing transactional distance within online courses, not only between learners and educators but also between learners and other learners. The concept of transactional distance is acknowledged to relate to a psychological space and, although it generally focuses on communication between educators and learners, the theory acknowledges different degrees of distance (Moore, 1993). In more than one respect these characteristics were reflected in this case by the online learning context and differences in learners' sense of community within large and small groups. In

essence, the learners' sense of community can be related to the degree of transactional distance.

From the students' point of view, unity and support in learning groups were closely related and one was frequently associated with the other in learner contributions.

Jenny (W8LGD)...*Even though I don't like working online I have found all the members have been very supportive and go out of their way to help. It doesn't take long to achieve a sense of unity especially with the small groups.*

Mary (W8LGD)...*We help and support each other wherever we can and we are not alone if we are unsure of what to do...*

Belinda (W8LGD)...*I am enjoying the OLG [online learning group] more-so with each passing week, due to the support of my fellow group members and the sense of unity that's evolving over time.*

Comparisons have been drawn between the density of social networks and the type of support that individuals receive within certain communities (Wellman & Gulia, 1999). Within this study the large group was identified as more densely populated but loosely knit, based on the number of connections between learners; by contrast, small groups were less densely populated but more tightly knit. Learners in this case perceived stronger connections with members of their small groups, and although they offered and received material and emotional support within both large and small groups, there were discernable differences in the nature of the support. In the following examples, the first two offers of support submitted to the large group appeared more functional than personal; the third was retrieved from a small group discussion and, by contrast, offered both emotional and material support in an empathetic and personalised way, reflecting both the connections and the relationships among learners in different groups.

Morgan (LGDW5) *If you want to cut and paste your work all you have to do is three simple steps:*

1. *CTRL A (Select All)*
2. *CTRL C (Copy)*
3. *CTRL V (Paste)*

Hold down the CTRL (control) button, usually bottom left hand corner and press the "A". This will select all you text to copy. The press CTRL C (copy) which will copy your text. Then to paste your text, open a post to the discussion board, put your cursor inside the box where you want to copy your info and press CTRL V (paste). And hey presto, you should have your text, as required. Hope this helps,

Emily (W6LGD) *Don't feel bad. I'm sure we are all guilty of ineffective listening. I know I am for sure...*

Jenny (W5SGA-AS)... *I am sorry to hear you are not well. I hope you can continue it would be a shame not to chat to you now we are getting to know each other. I think you are brave enrolling in 4 subjects, I am flat out handling 2. I know the ... subject has been very time consuming but maybe with one online talk and one post it will make it easier for all of us. I wonder if there is a way of setting up your computer so you can talk and the text will appear for you so you dont have to type as much. I dont know if that exists but it would be good for you if it did... Well I'm going to bed, bye for now.*

Within this case an online learning community evolved during the 12 week term and learners reported unity, cohesion and support within learning groups between weeks 3 and 8 of the course. This finding is at odds with educational literature which emphasises a continuing concern that computer-mediated interaction may not be a sufficiently rich mode of communication to sustain a sense of community (Haythornthwaite & Aviv, 2005).

Figure 5.15 illustrates the evolution of a community within the small online learning groups as it was in these groups that learners perceived the greatest sense of community. The diagram represents an integrated analysis of the small groups within this case and incorporates a series of stages and a range of activities that have been associated with community development (Wenger, 1998). The stages and activities are included because they reflect the results of the analysis already presented within this chapter. For example, the first three stages and the series of activities correspond with

relationship development which was discussed within section 5.6. The latter two relate to the processes of knowledge construction discussed in section 5.7.

Although the life of the course spanned a 12 week academic term course, statistics retrieved from the LMS indicated that several learners accessed course materials five weeks prior to the commencement of the term and up to eight weeks after the term had concluded. The fact that learners continued to access study materials and artefacts developed by the community for some time after official connections with group members had been severed lends support for the concept of an adaptive stage of development within the learning community.

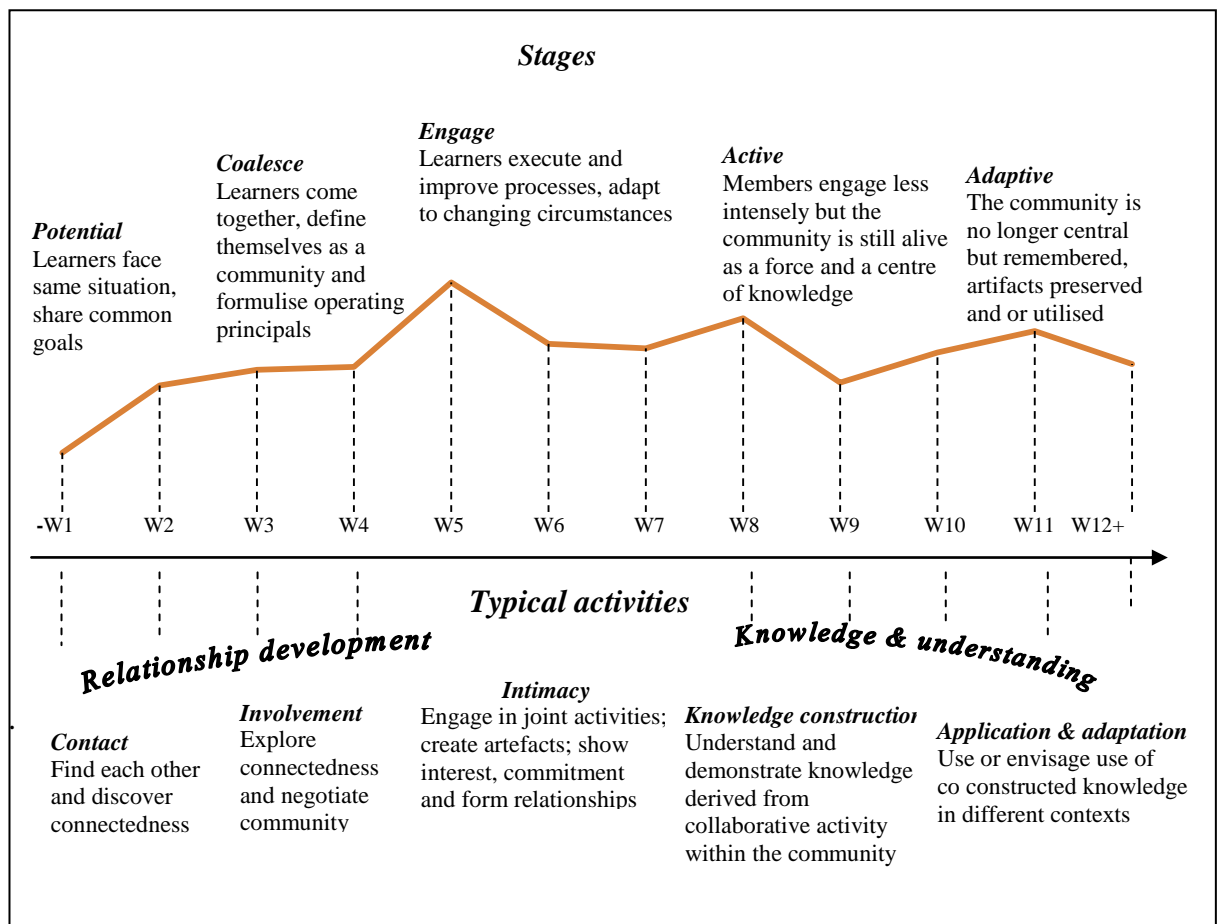


Figure 5.15 Evolution of a sense of community in the small online learning groups (adapted from Wenger, 1998, p. 3 of 9)

In this case, the social structure of online groups was found to influence levels of participation, the quality of interactions, the strength of the connections among learners and the nature of support that learners offered and received. The duration and consistency of group membership were also significant factors in learner perceptions of unity, cohesion and belonging within learning groups. Although students can learn a great deal from their exposure to a diverse range of perspectives and experiences these benefits may be countered if learners find it difficult to develop personal connections or relationships with peers in learning groups. The fact that learners utilised synchronous communication when it was not required may be significant as previous research suggests that synchronous communication contributes more than asynchronous communication to community building (Haythornthwaite, Kazmer, & Robins, 2000). Although this theory was not pursued in this investigation, attention has been drawn to the potentially significant role that synchronous communication played in the development of relationships among peers in learning groups (see section 5.6.2.4) and similarities between synchronous communication and speech (see section 5.7.2.4). Post-doctoral research may provide an opportunity to examine these possibilities to obtain further insight in relation to this particular case.

The concept of learning communities is to the fore of educational and organisational literature (Kilpatrick et al., 2003), because researchers and educators are becoming increasingly aware of the potential of learning communities to maximise learning (Palloff & Pratt, 2005b). Although there is theoretical debate about the role that communities play in the learning process, there is little doubt as to their value to learning (Hung, Tan, & Koh, 2006) and as a result there is a view that the development of learning communities should be considered a primary

educational goal. Even so, there is little empirical evidence to guide instructors in the development process (Palloff & Pratt, 1999). Brown (2001) maintains that a community cannot be forced and that members must be willing to be a community, a view given credence by the differences between large and small groups formed from the single cohort of students represented within this case. If Brown's (2001) assertion is correct then as educators we have little or no control over the development of learning communities.

Hill (1996) posits that:

...if we can learn what aspects of communities foster a strong psychological sense of community, and can learn to increase those aspects, perhaps we will not have to concern ourselves with specific problems and the interventions to deal with them. We could concentrate on forming healthy communities, and rely on the communities to form the healthy individuals... (p. 437)

Previous research suggests that strong feelings of community increase persistence in courses, the flow of information among learners, the availability of support and commitment to group goals (Wellman, 1999). By contrast, the results of this research suggest that these characteristics are the consequence of relationships among peers, that the learners' sense of community is derived from learning relationships and that learning relationships reduce transactional distance. Although as educators we cannot compel a sense of community, we can nurture relationships among learners as we do have control over curricula design and course content and have the ability to structure learning activities to promote learning relationships and dialogue among peers.

5.9 Consequence: Knowledge and understanding

The processes and consequences of the construction and reconstruction of knowledge construction within this case were reflective of transformational learning. Transformational learning is recognised as an adult form of metacognitive reasoning (Mezirow, 2003) with individual and social dimensions. The process involves learner participation in constructive discourse and use of the experience of others to validate, assess and advance arguments to support beliefs and implement decisions based on insights that may occur. In order for this to happen learners need to happen, learners need to become aware of how they construct knowledge and as aware as they can be about the values that inform their perspective (Mezirow, 2000). Gadamer contends that:

...where it is successful, understanding means a growth in inner awareness, which as a new experience encounters into the texture of our own mental experience. Understanding is like an adventure and, like any other adventure, is dangerous...But...[i]t is capable of contributing in a special way to the broadening of our human experiences, our self knowledge, and our horizon for everything understanding mediates is mediated along with ourselves. (Gadamer, 1981, as cited in Schwandt, 2000, p. 196)

From Gadamer's perspective understanding involves personal growth, self awareness and an element of risk. His view is shared by Mezirow, who suggests: "We make meaning with different dimensions of awareness and understanding" (Mezirow, 2000, p. 3). Transformational learning involves change specifically in meaning schemes and meaning perspectives. "A meaning scheme is the particular knowledge, beliefs, value judgements, and feelings that become articulated in an

interpretation” (Mezirow, 1991, p. 44), whereas a meaning perspective relates to a set of expectations or assumptions that serve as a belief system for interpreting and evaluating the meaning of experience. Within this structure past experience is assimilated and is used to transform new experiences and each meaning perspective contains a number of meaning schemes (Mezirow, 1991). As transformational learning involves using insight derived from reflection to guide action, transformation in a learner’s meaning perspective may lead him or her to acknowledge future intentions or predict future behaviour. In this case learner predictions related to communication behaviour.

Within this study the meaning schemes of learners were represented in their responses to learning activities, which have been used thus far to show how learners constructed and reconstructed knowledge within the course. The aim of this section is to offer examples of the knowledge and understanding that occurred as a consequence of learning relationships and to explain the association between the processes of knowledge construction, discussed in section 5.7, and the increased awareness of learners and the personal and collective transformation of individuals within the course.

5.9.1 Increased awareness: Self and others

We can learn about ourselves by a number of different means - for example through introspection, reflection and interaction with others. In this case the increased awareness of learners can be attributed to a combination of all three because learners participated in collaborative learning activities and engaged in a process of knowledge construction that involved remembering, internal and social negotiation and articulation. Introspection involves thinking about thoughts and feelings but it does not involve testing the validity of the experience; as a result it is

considered a thoughtful rather than a reflective action (Mezirow, 1991). Yet self-knowledge can occur as the result of thoughtful action as well as from content, process or premise reflection; examples of non-reflective and reflective action were presented in subsection 5.7.2.1. We also have an opportunity to increase our self-awareness through our interactions with others, learning how others see us and by reflecting on their perceptions (Wood, 2004). However, others are likely to offer their opinions only if they consider it safe to do so (Wood, 2004). Learners within this course formed close relationships with peers and their perceptions of safety, acceptance and support have already been discussed in this chapter. The relationships that developed provided learners with opportunities to learn about themselves and the voice and confidence that they associated with textual communication (see section 5.7.1) provided a mechanism for them to provide others with a reflection of themselves.

Learner concerns about appearing unintelligent were discussed in section 5.7.1 and learners were able to ascertain how they were perceived by others by the feedback that they received in response to their contributions to discussions. They were also able to draw comparisons between themselves and others from the contributions others submitted in response to online learning activities. Evidence that learners were reflective about themselves, course content and the perceptions of their peers is offered below. The examples illustrate introspection, content, process and premise reflection and indicate an intention to change behaviour.

Emily (W6LGD) *I...found those activities interesting. Most of what I thought was supportive and reassuring was evaluating and advising. I realise that I tend to try to problem solve for my friends as my way of supporting them- you know the old adage- If there is a problem- fix it! I am very problem solving oriented...However, I think that I must add enough supporting comments in there somewhere as they keep coming back to talk to me about stuff. It is something to be aware of though isn't it!*

Morgan (W6LGD) *...After reading Chapters six and seven in our textbook (Wood 2004) I have realised that I am not a mindful listener. Unfortunately, when I am listening to others I often focus on my own feelings and experiences and tend to interrupt others with these thoughts. I hate it that I do this and since beginning this course I have been alerted to the good and bad things about my communication style. I need to really work on mindful listening so I can be a more effective member of interactions...I tend to respond rapidly to what others post and delay actually reading and absorbing all of what they have said. For this I am truly sorry, and I will make a concerted effort to slow down and be a better listener. I think because I am not a mindful listener people may withhold information, or choose not to disclose personal information to me because they are concerned that I will not pay close attention to them and interrupt them with my own opinions. This could be a reason as to why I do not have many close friends.*

Yasmin (W6LGD) *After reading your submission I think I am a very inconsiderate listener. I mindfully listen for awhile but I find if the conversation bears little relevance to me and mine, or there is little learning content I tend to drift. I had not realised how hurt other people become and for this I am sorry. I guess it is like most things until we learn a truth it has very little i[m]pact on us. I agree with Nari this course has certainly softened my views and made me more aware of other views/stances. Thanks for being so willing to share...Thank you to each of you that open and share your thoughts-they certainly make me review mine.*

Learning is recognised as significant when learners actively seek information, use it to produce knowledge and integrate new knowledge within their cognitive structure (Henri, 1992). The learning of learners within this course was evidenced in part by reports of how they had begun to apply their knowledge and communication skills in diverse personal and professional contexts.

Jenny (W6LGD) *I find I tend to supportively listen to people outside the family but when it comes to my kids I tend to be too evaluating and advising. I have been practising just listening for pleasure, dual perspective and supporting approach with the kids...*

Kirin (W6LGD) *I had a conversation tonight with a friend. Her mum had told her she needed anger management. I was really trying to put my learning into practice. I was doing great with the paraphrasing, the analysing, the questioning and probing, making sure I wasn't monopolizing. She laughed at me for getting 'all psychological' and told me to "shut up or i'll crack you one". Then the conversation ended. Great friends I have!*

Emily (W6LGD) *Better luck next time. May I suggest (trying not to be too evaluationg / advising, ha ha) that maybe you could try lots of minimal encouragers..... mmmmm, yeah,..... mmmmmm, yeah,.... really? ,..... mmmm, etc! It may be a little less obvious (maybe!)*

Kirin (W6LGD) *I dont think I was too obvious, I think she was just expecting me to laugh and say "what an idiot, did you tell your mum where to go?" because thats the sort of relationship we have. And also she's studying similar subjects to me, so she caught on. It was funny though... I am learning so much!*

Rena (W8LGD) *... i am finding that what i am learning in this subject can be applied to others. I have already used concepts learnt in this subject in several of my assignments for other classes...and i think the concepts can be applied to other areas of study/life. Therefore, i don't mind spending a bit more time on this one instead of my other classes...*

In these examples learners demonstrate their efforts to integrate and apply new knowledge by testing it on family, friends and peers. In doing so they lend support to Mezirow's (1991) assertion that we validate new perspectives through rational discourse and by testing them on others.

5.9.2 Transformational learning: Personal and collective

While an increased awareness of the communication behaviour of self and others constitutes knowledge and potentially understanding, it need not necessarily lead to action and action based on insight is a definitional characteristic of transformational learning. The transformational process involves developing a more dependable frame of reference, "one that is more inclusive, differentiating, permeable (open to other viewpoints), critically reflective of assumptions, emotionally capable of change and integrative of experience" (Mezirow, 2000, p.19). Learner appreciation of the need to adopt a dual perspective for effective communication was discussed in section 5.7. This concept, appropriated from course content, was introduced by one learner to discussions in week 2 and it became a

popular term and dominant theme in learner contributions throughout the course.

Wood (2004), explains that:

When we adopt dual perspective, we understand how someone else thinks and feels about issues. To meet, another person in genuine dialogue, we must be able to realize how that person views himself or herself, the situation, and his or her thoughts and feelings. We may personally see things much differently, and we may want to express our perceptions. Yet we also need to understand and respect the other person's perspective. (p. 37)

Meaning transformation and the adoption of a dual perspective involve very similar, if not identical, processes, which is significant as in the following examples of personal transformation learners acknowledge the need to listen to what others have to say, discuss the value that they *now* place on the views of others and explain how aware they have become of their reactions and responses to others. The excerpts indicate that the change in learner perspective was derived from learner-learner interaction and an increased awareness of self.

Morgan (W8SG9-AS) *from group summary ...I think that both the small and large group interactions that have taken place online during this course will positively influence future group interactions for me. The content of the course has provided me with an abundance of knowledge regarding my personal communication and that of others and I will be able to use these skills and knowledge to better influence my interactions with others. In general, the online environment has made me listen to others and what they have to say, and respond accordingly. It has also increased my awareness of others opinions and how I respond to them. Quite often I can reply hastily, and inappropriately, but after experiencing weekly interactions online, I have become more in tune with how I respond.*

Fiona (W8SG9-AS) *from group summary ...From my point of view, the positives are that this experience has made me realise whilst more time is spent mulling over a particular point or topic because of the group participation and that consequently there is a lot of repetition of ideas, out of it all come some real "gems" of ideas that I wouldn't have thought of. This broadens my limited perception, appreciation and*

knowledge. The fact that we are individuals with different perceptions and perspectives hopefully sometimes enriches the final outcome or result. I learn from the interaction which is what should be happening for each group member. Autonomy is very limiting and often doesn't broaden one's horizons. I will be more patient and willing to listen and consider other people's views even if I don't agree with them...

Kelsie (W8SG9-AS) *from group summary ...I find it incredible the amount of theory behind communication which I believe I can now put to good use and build a little more confidence within my interactions. The online environment was very daunting to me at first, however the collaboration sessions have given me the experience I needed to feel more comfortable within expressing myself online. Like everyone else I have learnt a lot so far from this course which I am sure I can use in every type of communication I find myself in. One particular element I regard to be very important is to respect the diversity of group members as it appears to be a priceless tool for not only creativity but gathering and understanding knowledge.*

It is important to note that the excerpts above come from a summary submitted in week 8 by members of small group 9. Although the examples presented were deliberately selected from one group, the sentiments expressed were shared by members of other groups. The point is that perspective transformations occur not only in individuals but also in people involved in groups (Mezirow, 1991). The process frequently involves points of view expressed by others that are initially found discordant, distasteful or threatening but later recognised to be indispensable in dealing with our experience. In effect, we look to others to communicate alternative perspectives that may explain our dilemmas. Mezirow (1991) asserts that “When we find a promising perspective, we do not merely appropriate it but, by making an imaginative interpretation of it construe it to make it our own” (p. 185). His description reflects the process categorised and discussed in subsection 5.7.2.3.1 as collective reflection.

The characteristics of learning groups within this case shared the characteristics associated with consciousness raising groups, which is in itself interesting because of the learners’ increased awareness of self and others.

Consciousness raising groups have been found to be leaderless, everyone is heard and group norms are validated as members create new forms of interaction and relationships among themselves (Mezirow, 1991). In this course Simon described a decentralised pattern of power, learners less confident in group contexts perceived themselves to have a stronger voice through textual communication and unprompted learners initiated a range of communication strategies and small group protocols and developed close relationships with members of their small groups. The process involved opening up, sharing experiences, reflecting on contributions, taking account of feedback and noting how the remarks of others assisted them to understand their own experience.

Learning of the kind demonstrated within this course is sustainable; you cannot unlearn what you know about yourself (Mezirow, 1991). Moreover, being self aware and cognisant of the learning process and of the value of the contributions of others is likely to facilitate the continued construction and reconstruction of knowledge, which will in turn promote greater understanding and further transformation. In this case the online learning context of an undergraduate, communication course was conducive to transformational learning in diverse groups of students, to the extent that they predicted a positive change in their future communication behaviour both personally and professionally.

5.10 Modelling learning relationships as a substantive theory

Thus far the concept of learning relationships has been presented in a discussional form, primarily to reflect the developmental nature of the theoretical construct. The theory, which was constructed from the analyses of learner-learner interaction and knowledge construction within the online communication course, endeavours to explain the processes and consequences of learning relationships in

online contexts, specifically within this case. In acknowledgement of the complexity and the length of the preceding discussion, this section offers an illustration of learning relationships in online contexts as a theoretical model.

Figure 5.16 shows two contextual conditions, mediated interaction and social structure, which shape learner perceptions of the learning context. In this case the conditions were textual communication and large and small groups. Both the contextual conditions and learner perceptions of the learning environment had an impact on learning relationships. Participation in collaborative learning activities was a characteristic of the course design yet the nature of learner participation was self-determined and influenced by contextual conditions. Learners were found to interact with content and other learners to meet learning objectives and initiated a range of communication strategies to overcome the social and educational challenges they associated with textual communication and collaborative activities in online groups. Together the learners' sense of place, their participation in learning activities and the communication strategies that they devised promoted the development of open, supportive relationships with peers in both large and small groups, but more so in small groups. The openness of these relationships facilitated a conversational mode of learning, one which necessitated remembering, negotiating and articulating experience, knowledge and understanding. The connections between and support among learners promoted a sense of community within the course and their ability to share, model and scaffold experiences, knowledge and understanding, combined with their perceptions of one another, led to an increased understanding of self and others and resulted in both personal and collective transformations.

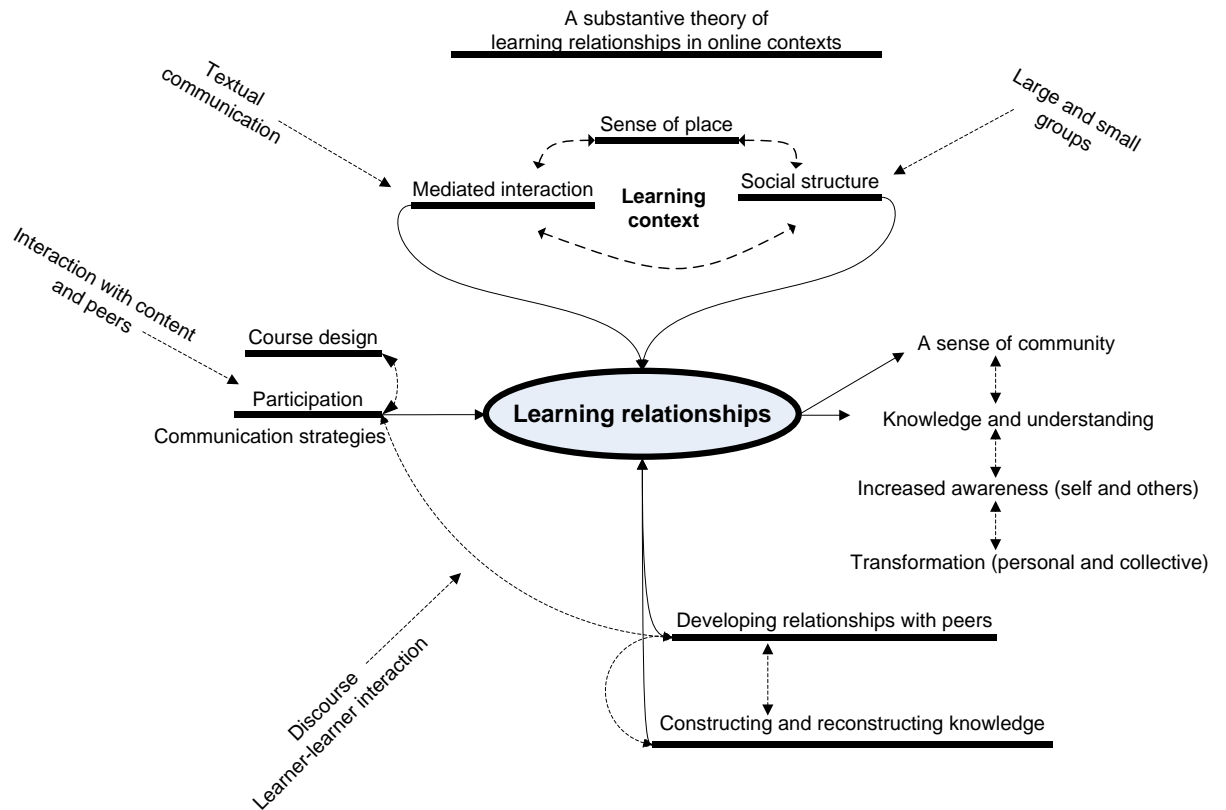


Figure 5.16 *Modelling learning relationships in online contexts as a substantive theory*

The model illustrates the significance of the learning context as enacted through four dimensions: mediated interaction (asynchronous and synchronous communication), social structure (group size), course design (learning activities) and learner-learner interaction. These aspects are linked to key elements of the theory and represent areas that may be targeted through educational interventions to promote the development of learning relationships in online contexts. The purpose of the model is to enhance understanding of the substantive theory, to enable practitioners to visualise the concept so that they may be able to evaluate the ‘fit’ of the theory and to facilitate the application of knowledge derived from this case.

5.11 Summary of the chapter

The purpose of this research was to explore and understand the relationship between learner-learner interaction and knowledge construction within the online

learning context of an undergraduate communication course. A series of questions were formulated to guide the collection and analysis of data and two diverse but complementary methods were utilised to arrive at an understanding of each process and the relationship between them: SNA and constant comparative analysis. The results of the integrated analyses led to the construction of a substantive theory about learning relationships in online contexts.

Learning relationships were identified as a core category within this investigation as each finding considered to be significant could be related to this concept as a subcategory. Subcategories comprised of conditions, intervening conditions, action/interactions and consequences. Textual communication and groups formed the basis of contextual conditions within the course as learners were required to communicate synchronously and asynchronously in large and small groups to complete learning activities during a 12 week term. Contextual conditions and learner perceptions of the learning context shaped the ways that learners participated in collaborative learning activities and constructed knowledge within the course.

The need to communicate, textually, in groups, presented learners with a number of social and educational challenges which led them to implement a range of self-initiated communication strategies. As the nature, extent and form of participation and the strategies devised were determined by learners, not the educator or the course design, these components were categorised as intervening conditions within the study. Differences were discerned in the types, degree and frequency of learner-learner interaction and a comparative analysis of large and small groups revealed that individual contributions to small group discussions exceeded those contributed to large group discussions. Therefore despite being less densely populated the number of connections between learners was greater in small groups.

Learners who were prominent in large group discussions were not necessarily central in small group discussion and those learners who did not contribute to large group discussions participated in small group activities. Unlike the large group, small groups were consistent in their use of synchronous communication throughout the term despite the requirement to use this mode only three times; both individuals and groups exhibited preferences for particular modes of communication.

The size of the group was found to impact participation in learning activities, and learner interaction in what was perceived to be a safe if disorientating environment promoted the development of relationships among peers in different learning groups. Learners were inclined to associate intimacy and connection with members of their small groups and, although connections among members of small groups were considered stronger than those in the large group, the large group offered diversity and access to a wide range of resources and support. The processes of relationship development and the dimensions of learner relationships were closely related and differed from those formed in face-to-face contexts and an adapted relationship model was utilised to illustrate the processes within this case. Social loafing and prominence were identified as opposing forces within learning groups and each held the potential to weaken or dissolve learning relationships.

Textual communication offered opportunities not available in traditional classrooms, including a forum for uninterrupted speech, a reduction in physical noise and time to reflect, prepare and review thoughts before engaging in discussions. When this was combined with an environment that felt safe; if at times a little disorientating, learners were able to construct knowledge by sharing, comparing and negotiating understandings using a conversational mode of learning. The consequences of the contextual and intervening conditions and the actions and

interactions of learners in this case promoted a sense of community, enhanced the learners' understandings of theoretical concepts, increased their awareness of self and others and led to personal and collective transformation.

The model of learning relationships illustrated key aspects of the theory and identified particular areas that may be targeted with educational interventions to facilitate and promote the development of learning relationships in online contexts. The results of the analyses of learner-learner interaction and knowledge construction within this case demonstrate that undergraduate learners participating in a first year online course can develop close relationships with peers, a sense of community and experience learning which leads to personal and collective transformation within a 12 week term. The significance of this finding and its implications for practice are discussed in Chapter 6.

The following chapter integrates learning relationships as a substantive theory by locating the study and the results within the substantive area of online learning. Also discussed are connections between the findings of this research and formal theories, specifically Vygotsky's (1978, 1981, 1986) theory of development which served as a conceptual framework and Mezirow's (1991) theory of transformational learning which emerged significant from the analyses of knowledge construction within the online course.

CHAPTER 6

SUMMARY, DISCUSSION AND CONCLUSION

6.1 Introduction

Learning relationships in online contexts are acknowledged as a developing concept and as such constitute a provisional, theoretical, interpretation of the data and the case within this study. Nutbeam and Harris (2004) contend that “Ultimately, theories and models are simplified representations of reality - they can never include or explain all of the complexities of individual, social or organisational behaviours...” (p. 8). If it is to be useful, the theory needs to be readily understood and capable of application to real-life conditions of practice, yet “One of the greatest challenges for practitioners is to identify how best to achieve a fit between the issues of interest and established theories or models which could improve the effectiveness of a program or an intervention” (Nutbeam & Harris, 2004, p. 8).

The aim in this chapter is to summarise and discuss the significance of the study and the educational implications of learning relationships as a theoretical construct by locating the study and the results within the substantive area of online learning, evaluating the relevance of Vygotsky’s theory of development as a conceptual framework and exploring the importance of transformation as a consequence of learning relationships in online contexts. Also examined are the study’s contributions to methodological knowledge, the limitations of the research and issues arising from this work which merit further investigation.

Upon reflection, the primary intent is not dissimilar to the process observed in the behaviour of learners within the communication course as they too endeavoured to integrate new knowledge by testing it on others using discourse and reasoned rationales. Here, an additional purpose is to demonstrate the ‘fit’ of the theory and

provide examples of where, when and how knowledge constructed from this case may be applied in educational practice to improve learning in online contexts.

6.2 Locating the study and results within the substantive area of online learning

The aim within this section is to locate the study and the results within the area of online learning, illustrate the study's contribution to empirical knowledge and discuss potential applications of that contribution in educational practice.

The literature review presented in Chapter 2 located this study within the research field of distance education and identified online learning as one facet of a broad spectrum of approaches. The review suggested that online learning contexts offer an educational domain unique in their potential for interaction, participation and collaboration (Kumpulainen & Mutanen, 2000) and that context in online courses is significant because it creates a social climate that impacts upon interactions and group dynamics (Gunawardena et al., 2001). Although considerable effort is expended to develop and implement online learning environments, they often fail to create effective settings for learning and knowledge construction (Oliver & Herrington, 2003). The question of how learners interact in computer supported, group based learning has received increasing research attention (Strijbos et al., 2004), yet little is known about the dynamics and processes of learner-learner interaction and how these relate to learning (Kumpulainen & Mutanen, 1999; McLoughlin & Luca, 1999).

The purpose of this study was to understand the processes of, and the relationship between, learner interaction and knowledge construction within the context of an online communication course and the analyses revealed how learners interacted and constructed knowledge within large and small groups using

asynchronous and synchronous communication, how individual learners conceptualised interaction and knowledge construction within the context of the online course and how learner perceptions shaped communication and learning in online groups. The findings indicated that undergraduate learners participating in a first year online course can develop close relationships with peers and a sense of community (Rossi, 2008a) as well as experience learning which leads to personal and collective transformation within a 12 week term. Based on the results of the analyses a theory of learning relationships in online contexts was constructed.

Siemens (2005) is of the view that an alternative theory of learning is required to guide educational practice in today's networked society; others, however, are of the view that educators ought to be able to adapt and integrate theories to inform the design of online courses, contexts and resources (Ally, 2008; Anderson, 2008b). As the aim of this section is to locate learning relationships and associated categories within the substantive area and of subsequent sections to explain the connections between the constructed substantive theory and extant, formal theories, an integrated approach has been adopted within this chapter to provide theoretical and evidence based rationales which may be used to support the practical application of knowledge constructed from this case.

Although Anderson (2008b) considers theoretical models a first step towards constructing a theory, in this dissertation, theories have preceded the creation of theoretical models. The models that have been presented have represented the researcher's understanding of theoretical concepts and been used to explain diverse, and at times, complex elements associated with particular theories. By contrast, Figure 6.1 locates this study within the preliminary theoretical framework developed

by Anderson (2008b) and shows areas in which this research contributes significantly to existing knowledge.

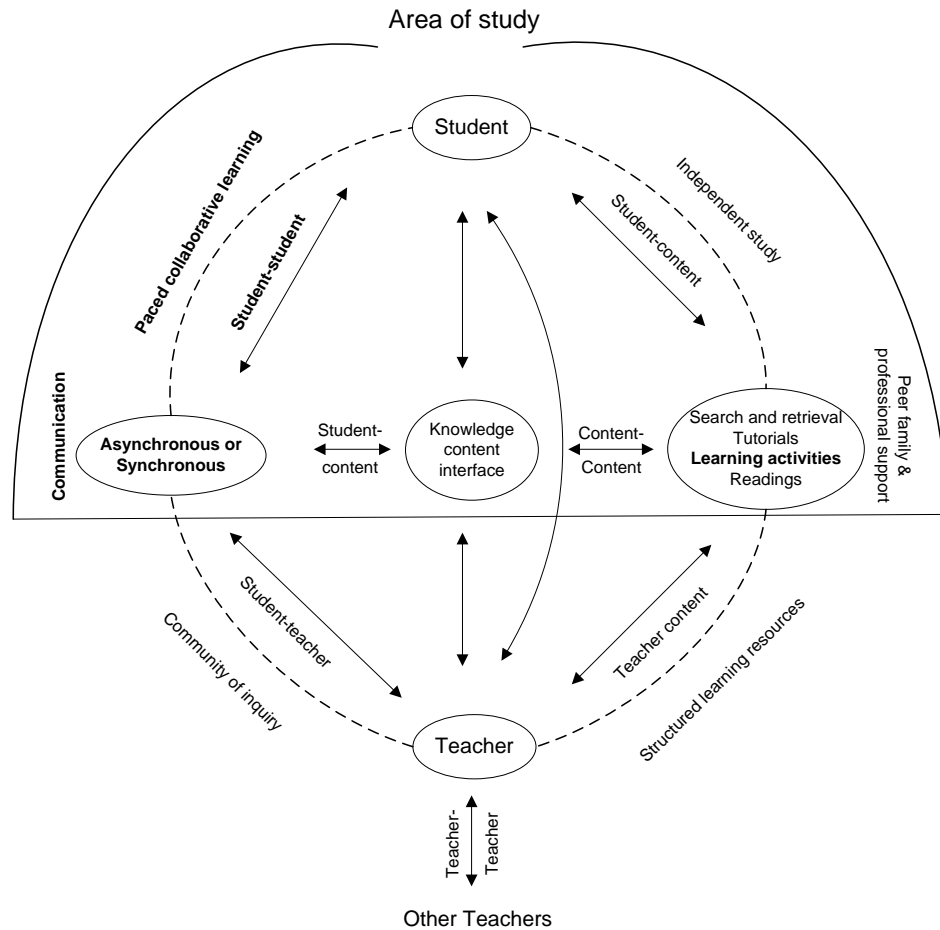


Figure 6.1 Location of the study in relation to online learning theory (adapted from Anderson, 2008b, p. 81).

Although not yet a theory, the model was identified in Chapter 2 as having the potential to provide an informed basis from which to coordinate and extend knowledge and understanding of distance education, online learning and teaching and learning practice from a social constructivist perspective. As previously discussed, the model illustrates many of the key factors believed to interact to create online contexts and educational experiences (Anderson, 2008b) and is based on the premise that effective learning is learner-centred, community-centred, knowledge-centred and assessment-centred (Bransford, Brown, & Cocking, 1999). The diagram

shows two sets of actors - students and teachers - and that interaction among actors and between actors and content occurs through asynchronous and synchronous communication. Six types of interaction are recognised - student-content, student-student, student-teacher, teacher-teacher, teacher-content and content-content interaction - which are based on the work of Moore and supplemented by that of Anderson and Garrison (Anderson, 2008b). Both collaborative and independent learning are represented. Collaborative learning may take the form of collaborative communities of inquiry or communities of learning which are reflected on the left of the model. Independent learning is depicted on the right, together with a range of structured learning resources (Anderson, 2008b) .

Anderson's (2008b) intention is to promote understanding of complex online educational contexts and to move discussion towards the development of hypotheses, predictions and improvements in online educational practice. He is of the view that the next step in the process is to theorise and measure the direction and magnitude of the effect of each variable on relevant outcome variables, including learning. Even though this study was not designed for these purposes, the results of this research offers insights into learner-learner interaction, learner participation in collaborative learning activities and the consequences of learning relationships in large and small groups of learners, communicating synchronously and asynchronously within an online communication course. Figure 6.2 illustrates the study's contribution to the development of a theory of online learning and the use of fourth generation communication tools in distance education. The diagram draws attention to the focus of the investigation and highlights the prevalence of learner-learner, learner-content and teacher-content interaction within the course and the consequences of these forms of interaction, within online learning contexts.

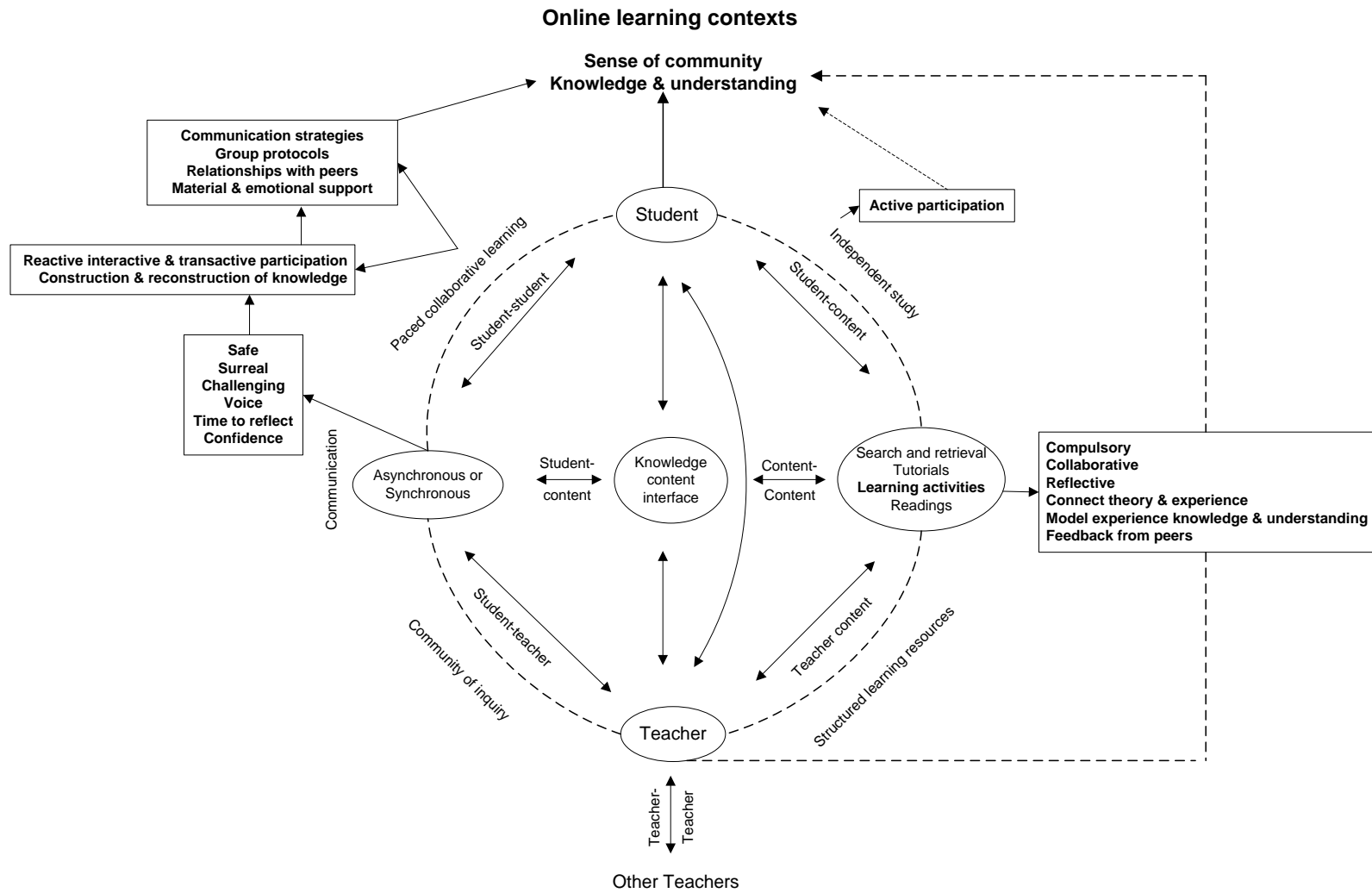


Figure 6.2 The study's contribution to the development of a theory of online learning

Anderson (2008b) points out that there is no formula that dictates the type of interaction that is best for online learning but suggests that the model of online learning may be used to identify and plan an appropriate mix of different forms of interaction dependent upon anticipated outcomes and learning objectives. He also contends that because the challenge of defining when interactions have educational value remains unresolved all types of interaction should be assessed by their contribution to learning (Anderson, 2003). In this case learner-learner interaction facilitated the development of relationships among peers, contributed to the students' sense of community and their knowledge and enhanced understanding of theoretical concepts, self and others.

6.2.1 Online learning contexts

Learner-learner interaction has, as indicated in Chapter 2, traditionally, been downplayed in distance education, whereas learner-content and learner-teacher interaction have always been considered important components of the educational process (Anderson, 2008b). Today, however, online learning contexts provide increased opportunities for learner-learner interaction. Constructivist and connectivist views of learning stress the value of learner-learner interaction (Anderson, 2008b). Research suggests that learner led groups can reach higher levels of cognitive, social and teaching presence than those led by teachers (Rourke & Anderson, 2002) and learner-learner interaction is acknowledged to play a critical role in the development of communities of learning (Rourke et al., 1999). It is inevitable, when evolving theoretical perspectives are supported by the affordances of online environments and educational research, that they will have significant implications for educational practice - specifically the design of online learning activities, online learning contexts and learner-learner interaction.

Learning activities within the communication course had been designed to encourage learner-learner interaction and learner participation in both individual and collaborative learning activities, participation was compulsory and assessment orientated as 25% of the total grade was awarded for this component of the course. Although participation and collaboration were monitored by the course co-ordinator during course delivery, the co-ordinator's principal role involved the development of the online learning context, learning activities and course resources and the provision of guidance, support and feedback for learners during the term. Learner-learner and learner-content were the predominant forms of interaction and students assumed responsibility for their participation, collaboration and learning in large and small groups. Although Anderson's model associates structured learning activities with independent learning, in this case activities were structured to facilitate paced collaborative learning throughout the 12 week course. Therefore the learning context within the course was learner-centred, knowledge-centred, assessment-centred and community-centred, to the extent that different learning groups were established.

6.2.2 Asynchronous and synchronous communication

In this case asynchronous and synchronous communication was found to offer learners opportunities not available in traditional classrooms, including a forum for uninterrupted speech, a reduction in physical noise and time to reflect, prepare and review thoughts and content prior to engaging in collaborative discussions. Individuals and groups exhibited preferences for particular modes of communication and groups used each mode for different purposes. Although the large group used synchronous communication only once, small groups were consistent in their use of synchronous communication throughout the term. In some ways asynchronous and synchronous communication could be viewed as complementary, offering learners,

in the first instance, time to think and reflect and in the second, the immediacy and connection of a real-time conversation.

Anderson (2008b) points out that there is no single medium that is best for online learning and is of the view that educators must develop the means to respond to the needs of the curricula and learners. Given the diverse uses by and preferences of learners within this course, if the aim is to design a learner-centred learning context then educators should consider the educational and relational value of incorporating both asynchronous and synchronous communication within online courses, rather than choose one mode of communication over another. Course evaluations which incorporate a review of the achievement of learning objectives as well as the uses of and preferences for different modes of communication by learners could inform the purpose of use and the extent to which these modes are used in future offerings of online courses.

6.2.3 Collaborative learning

In this case, collaborative learning activities were designed to facilitate the use of asynchronous and synchronous communication and to promote learner-learner interaction in large and small groups. The analyses revealed that the teaching and learning strategies in this course prompted reflection, encouraged collaboration and enabled learners to observe, monitor and evaluate communication behaviour, explore connections between theory and practice, articulate knowledge and understanding and apply new knowledge and communication skills in online and face-to-face encounters. Thus the online context had the capacity to facilitate a diverse range of learning activities and learning behaviours.

Early in the study the SNA identified when learners were most interactive within the course and the weeks when the greatest variation in the frequency of

messages between learners occurred. The results were consistent with the work of Levin (2005), in that they were greatest between one third and one quarter of the way through the academic term. As it is possible to discern measures of density from system logs within the LMS, it would also be possible to structure and schedule collaborative activities in order to enhance efficacy.

Measures of prominence may also have educational applications. For example, within this course the assessment of participation and interaction was undertaken by the course co-ordinator using marking criteria and an author list view of messages posted to discussions. Measures of prominence may offer a more objective and reliable indication of both the level and the influence of learner interactions in online discussions. Further extrapolated, prominent actors could be selectively allocated to online groups to promote learner-learner interaction (Rossi, 2008b) However, as both social loafing and prominence were found to have a detrimental effect on the development of learning relationships it would be important to monitor the levels and frequency of participation and learner-learner interaction as learners engage in collaborative learning activities.

Salmon (2002) contends that online communication promotes reflection in both individuals and groups but suggests that "...reflecting in groups, depends on the availability of a large enough cohort of "others", appearing and contributing online at appropriate moments" (p. 388). Salmon (2002) does not quantify how many students constitute "a large enough cohort" however, the results of this study indicate that learners effectively reflected individually, in small groups of three to five and in a large group of 20 learners. Although asynchronous communication was found to afford learners time to reflect, participation in collaborative learning activities was negatively affected by the number of learners in the large group. Also, while learners

appreciated the diversity of and access to a range of resources and support from large group members, they were inclined to associate intimacy and connection with members of small groups. The comparative analysis of learner-learner interaction also revealed that learner contributions to small group discussions exceeded contributions to large group discussions, and learners were more committed to and invested more time and effort in small group discussion. This finding could inform the design of future collaborative activities to maximise benefits from both large and small group collaboration.

Many individuals find the reflective process threatening, because it involves a degree of self-criticism (Ghaye & Ghaye, 1998), yet learners in this course reported feeling safe and acknowledged a voice and confidence not experienced in traditional learning contexts, which indicates that online contexts may be more conducive to reflective activity in individuals and groups. It is, however, questionable whether students in this first year course would have engaged in reflection had learning activities not been designed to facilitate the process or if collaboration had not been an assessable component of the course.

Much of the early work on the instructional use of online contexts focused on developing strategies to maximise interaction (Daloz, 2000), perhaps because the online medium is capable of facilitating interaction or perhaps because research suggests that interaction among learners makes a positive contribution to student learning and is a significant factor in successful online learning (Su et al., 2005). Educators are becoming increasingly aware of the potential of learning communities to maximise learning and there is a belief that collaborative engagement within community contexts will facilitate the successful achievement of learning objectives. A certain interdependence is acknowledged between communities and collaboration

as collaborative activity can assist the development of a sense of community but a sense of community is also needed in order for collaboration to occur (Palloff & Pratt, 2005a).

Strong feelings of community are believed to increase persistence in courses, the flow of information among learners, the availability of support and commitment to group goals (Wellman, 1999). As a result there is a perception that the development of learning communities should be considered a primary educational goal, yet there is little empirical evidence to guide instructors in the development process (Palloff & Pratt, 1999). The supposition within this dissertation is that relationships with peers provide learners with an effective means of social and educational support and are a key factor in the development of a learner's sense of community. This idea has important implications as it places emphasis on the relational aspects of interpersonal communication over activity and frequency of interaction and emphasises the need to facilitate and promote the development of relationships among peers within online learning contexts (Rossi, 2009). While as educators we may not be able to compel a sense of community (Brown, 2001), we can facilitate and nurture relationships among learners, through curricula design; by creating a social structure, developing and scheduling collaborative activities and encouraging asynchronous and synchronous communication. In this way, the educational emphasis is on the development of learning relationships, and enabling learners to assume control in and responsibility for developing their own learning community, one that meets the needs of both individuals and groups.

6.3 Evaluating the relevance of Vygotsky's theory of development as a conceptual framework

Vygotsky's theory of development was identified in Chapter 3 as a sensitising topic and point of theoretical departure for this study. The use of theoretical frameworks in grounded theory studies was also acknowledged to differ from their use in traditional research, as when constructing theory conceptual frameworks may be used to explain the researcher's conceptual logic, locate specific arguments, engage leading ideas, position the new theory in relation to extant theories and explain the significance of the concepts constructed (Charmaz, 2006). The following discussion explains the relevance of Vygotsky's theoretical constructs in this case, shows connections between Vygotsky's theory of development and learning relationships as a concept and explores the significance and the implications of the theoretical knowledge constructed from this research.

Vygotsky conceptualised development as the transformation of socially shared activities into internalised processes and recognised a complex relationship between history as change and history as universal human progress (Wertsch et al., 1995). With a deep appreciation of both developmental and environmental forces, Vygotsky was one of the few theorists to consider an integrative theory (Crain, 2005). Indeed, the strength of his theory was believed to lie in its explanation of the dynamic interdependence of social and individual processes (John-Steiner & Mahn, 1996). Three major themes were described in Chapter 3 which represent the principles on which Vygotsky's theory is based; these were that: individual development, including higher mental function, has its origins in social sources (ZPD); human action on a social and individual level is mediated by tools and signs (semiotic mediation); and the first two themes are best examined through genetic or developmental analysis (John-Steiner & Mahn, 1996; Palinesar, 1998).

The online course, selected as a case served an educational purpose as learners were required to collaborate with one another to complete learning activities. Online learning environments are recognised as unique cultural contexts (Daloz, 2000). Communication did not occur face-to-face but was electronically mediated by computer networks and the use of hardware and software. Therefore participants were required to use technical tools and written text to interact, construct knowledge and achieve learning objectives. Selection of Vygotsky's theory of development, as a point of departure within the study, was based on the synergies among the researcher's philosophical views of learning, the theoretical constructs which form the basis of the theory and the contextual conditions associated with the course. Essentially, Vygotsky's theory was constructivist in origin and founded on the principle that individuals construct knowledge based on their experience and constantly refine their knowledge of the world by interacting with the environment in social and cultural contexts (Kanuka & Anderson, 1999). Figure 6.3 illustrates conceptual links between Vygotsky's theory of development and the online course; thus the diagram augments the model of Vygotsky's theory presented in Chapter 3.

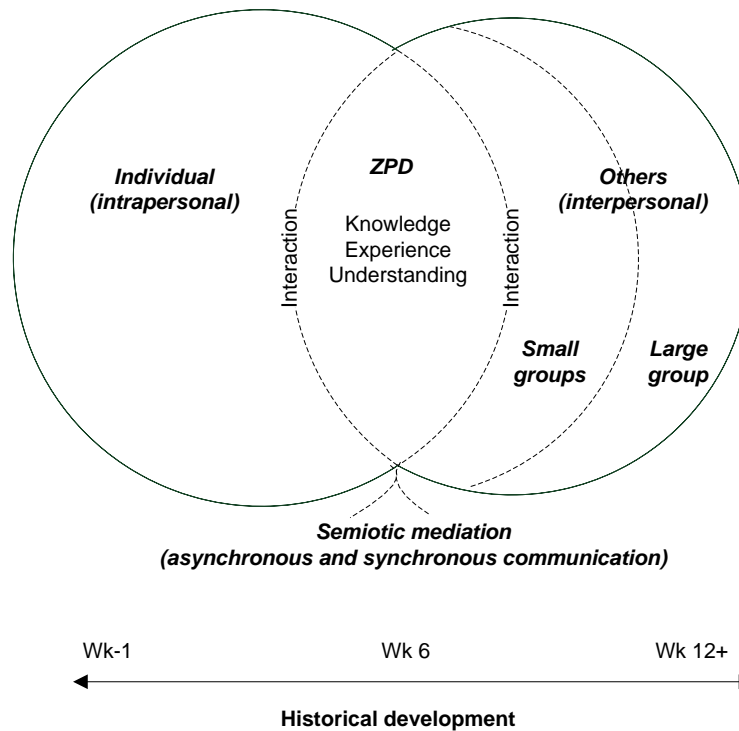


Figure 6.3 Conceptual links between Vygotsky's theory of development and the case

As before the key constructs - semiotic mediation, the ZPD and genetic analysis - are represented within the diagram. In this case, semiotic mediation corresponds with asynchronous and synchronous communication within the online course and the ZPD is depicted as the intersection between individuals and others. The distinction between, but the overlap of, individuals and others in small groups and the large group reflects the embedded case design illustrates the social structure of the online learning community and shows the interdependence between the individual and others referred to in Vygotsky's theory. Similarly, the concept of genetic or historical development is illustrated as a time continuum which extends beyond the 12 week term.

6.3.1 Semiotic mediation

Within Vygotsky's theory the concept of semiotic mediation was considered the key to all aspects of knowledge co-construction, and as Figure 6.3 illustrates,

within this case, asynchronous and synchronous communication facilitated collaboration by connecting individual learners with others through electronic text. Thus textual communication mediated interaction and knowledge construction within the online course. Within this dissertation, attention has been drawn to differences in the nature, use and perceptions of synchronous and asynchronous communication. The behaviour and beliefs of learners within the online course suggested that the distinction between monologic and dialogic speech can equally apply to synchronous and asynchronous communication although, at the time, Vygotsky was referring to written and verbal communication.

In this case, synchronous contributions were generally shorter, associated with immediacy and considered similar to verbal speech while asynchronous posts were often long and complex contained a range of points and in many ways were monologic. The majority of procedural or organisational aspects associated with group work, such as organising collaboration times, sharing resources or collaborating to complete the group summary, were accomplished asynchronously and both individuals and groups exhibited preferences for particular modes of communication. Vygotsky associated dialogue or social speech with immediate, unpremeditated utterances, which reflects learner views of synchronous communication. By contrast, written speech was associated with linguistic elaboration which could be attended to leisurely and consciously. Vygotsky considered this form of communication to be more complex than dialogic speech and acknowledged that learners required more words and more skill to express their meaning (Mejias, 2004; Vygotsky, 1986). These characteristics are reflected in the length of asynchronous contributions, learner perceptions about the time they had

spent and the time required to consider and construct asynchronous responses and the challenges they reported communicating textually.

The importance of the role and the significance of the use of language for effective communication were acknowledged in the contributions of learners as they discussed both the challenge and the need to convey meaning using only text. Fiona's extract drew attention to the fact that mediated interaction requires learners to focus on words, learn to express themselves and draw conclusions about the meanings of others using imagination as a psychological tool.

Fiona (W8LGD) *I think this week's discussion is really honing in on the essence of what we're doing here in this course. What some of you are saying is that suddenly, there is no sound, we don't hear each other, we don't see each other, and we don't touch each other - it's just the words on the "page"...I see online communication as an exercise in imagination, in concentrating on language to a much greater degree than we do in our daily lives; it requires us to express ourselves far more distinctly and to think far more about our use of language - the words we use - emoticons help - but I wonder whether in some convoluted or backdoor way that the use of the English language will experience a revival and that our level of English expression will improve - to me this is a good thing and can only ultimately increase our ability to communicate effectively - When we lose one of our vital senses, such as eyesight, other senses are heightened, like our hearing and sense of touch - and so the same applies to this exercise - we are using...our ability to spell and form words and then write (or type) them onto the page. Without all the other "distractions" of smell, sight, touch and sound we are forced to concentrate on one thing only - WORDS.*

Wells (1999) outlines four conditions, which he contends apply, when making meaning with text in any context.

First, there must be an activity system and associated community within which the writing plays a significant role. For the writing to engage the commitment of the writer the resulting text must be functional with respect to joint activity in which the writer is involved with at least some other members. Second it must concern a topic in which the writer is interested and

about which he or she believes there is more to discover. And third, the writer must care sufficiently about the aesthetic quality of the textual artefact that he or she is creating to engage with, and find solutions to, the problems that arise in the process of its creation. Finally the writer must be able to count on the community to give help in accessing textual and other relevant resources and in providing support and guidance as this is felt to be necessary. (p. 289)

These conditions are significant for a number of reasons. First they reflect conditions that Vygotsky himself proposed (Wells, 1999), and they offer guidelines for educational practice, particularly within online learning contexts. They are also evidenced within, and are therefore supported by, the findings of this study. For example, the online course was acknowledged in Chapter 5 to reflect an online learning community and a sense of community was perceived by learners within the course. The community consisted of a large group, small groups and individuals who were required to communicate textually to complete collaborative learning activities in order to meet the educational requirements of an educational unit of study. Learner participation in activities was assessed and learners were observed offering and receiving material and emotional support from members in their learning groups. Learners also recognised the value of their learning as they both incorporated and predicted diverse applications of the knowledge they had attained during the course.

6.3.2 Zone of proximal development

Vygotsky posited that “Learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and with his peers...” (Vygotsky, 1981, p. 80). Thus his theory

emphasised the interdependence between individuals and others and identified context as a condition of development and development as a process. Vygotsky conceived the concept of a ZPD to support his view of learning and development and argued that in order to understand the relationship between them it was necessary to distinguish between two developmental levels: the actual and the potential. The actual refers to those accomplishments an individual can demonstrate independently whereas potential levels are those that can be achieved with assistance (Palinesar, 1998). The ZPD therefore relates to shifts in control and transitions from one level to the other which are dependent on the stage of development of the individual (Confrey, 1995). Wells (1999) locates the ZPD *in the interaction* between learners engaged in activity; thus Figure 6.3 illustrates both conceptually and metaphorically the position of the ZPD.

Figure 6.4 utilises the conceptual model of Vygotsky's theory to frame the results of the analyses from the case. Within the diagram: intrapersonal activity is positioned within the sphere of the individual; interpersonal activity, which includes learner-learner interaction, the development of relationships and knowledge construction are located within the ZPD; and the consequences of these processes are located within the sphere of the learning community. Interaction, which encapsulates the ZPD, is shown as permeable, and reflects the communication between and the interdependence of individuals and others within the course. Learners are interdependent as they are required to collaborate as members of a large and a small group to complete learning activities.

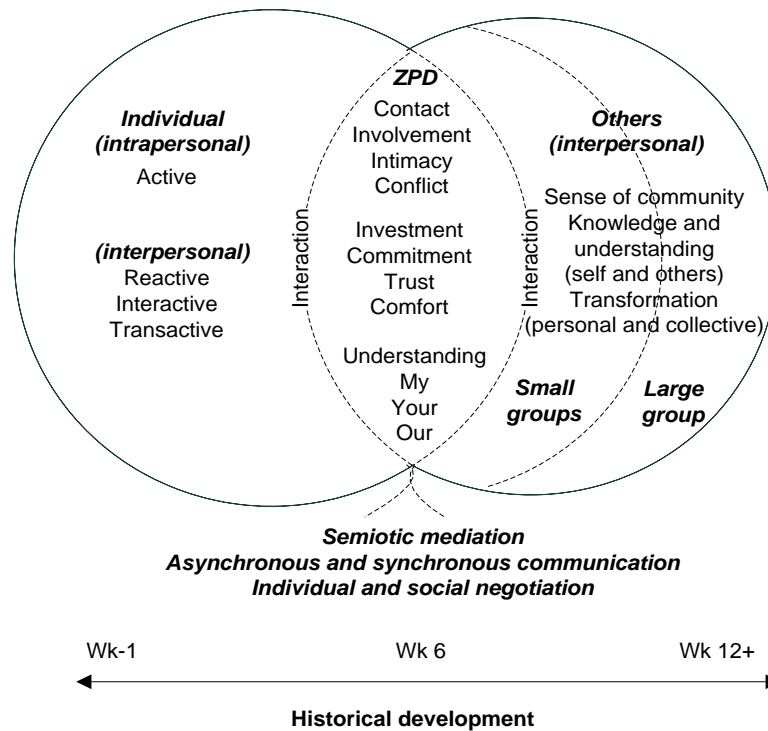


Figure 6.4 Research results framed by a conceptual model of Vygotsky's theory of development

What is both striking and significant within the illustration is the dominance of relational characteristics within the ZPD. Within this study, learning relationships were identified as the core category and it was around this concept that the substantive theory was constructed. Vygotsky contends that “all higher mental functions are internalized social relationships” (Vygotsky, 1981, p. 164). Given that higher mental functions relate to memory, attention, thinking, meaning and perception and are associated with learning, Vygotsky's theory implicitly acknowledges the significance of relationships in the learning process.

Internalisation plays a central role in Vygotsky's theory, to the extent that Wells (1999) suggests that interaction could be considered the means and internalisation the end within the ZPD. The question of internalisation is, however, one aspect of Vygotsky's theory that has been contested, as some believe that the

concept lacks explanatory power while others consider the differentiation between internal and external processes to be too distinct (Wells, 1999). In this case, the collective reflection of learners and their practice of submitting extensions and additions to individual and other contributions indicate that students internalised external activity and the knowledge and experience of others. Thus they were at once dependent on, yet contributed to, the development of others within the learning community. Figure 6.4 illustrates, through the dimensions of learning (my understanding, your understanding and our understanding), that the concept of internalisation need not preclude interdependence between the individual and others within a learning community, lending support for the inclusion of internalisation as a concept within an integrated theory of development.

The purpose of assessment of the ZPD is to inform instructional practice (Wells, 1999) and to that end Wertsch (1985) identifies four criteria for distinguishing higher mental functions. These include: a shift in control from the environment to the individual in voluntary regulation; the emergence of conscious realisation of mental processes; the social origins and the social nature of higher mental functions; and the use of signs to mediate higher mental functions. The analyses of learner-learner interaction within this case revealed that students achieved a level of higher mental functioning, meeting all four criteria.

Control of the environment and voluntary regulation were for the most part group rather than individually orientated. For example, learners in this course: adapted their textual communication to convey non-verbal cues; within the large group they adhered to requests from other learners to avoid the use of attachments; each small group developed protocols for communication and collaboration which included regular use of synchronous communication each week when only three

synchronous sessions were required; and group 3 assumed control by choosing to communicate through MSN to accommodate the needs of one individual and the collaboration tool to meet institutional expectations. The emergence of the conscious realisation of mental processes was evidenced by the consequences of learning relationships, specifically through the learners' demonstration of increased understanding of theoretical concepts, self and others. The social origins, and the social nature, of higher mental functions were evidenced by reflective triggers and the collective reflection of learners, which often led to further reflection and increased self awareness. Learners also devised and implemented a range of communication strategies including electronic text, emoticons, photographs and brackets, to mediate higher mental functions.

In online contexts, semiotic mediation, specifically asynchronous and synchronous communication, shares the properties of physical and psychological tools. Within Figures 6.3 and 6.4 interaction formed the shape of a lens between individuals and others; this analogy is significant as, through these interactions, learners had an opportunity to view both themselves and others. They were also able to observe, synthesise and internalise the experience, thinking, meaning and perceptions of others, which facilitated the acquisition of useful knowledge skills and strategies which could be applied in a wide range of situations.

6.3.3 Genetic analysis

Vygotsky was interested in all forms of behaviour, but, unlike his contemporaries, he did not believe that a description of current behaviour could provide an adequate explanation of what was observed (Wells, 1999). His theory looked beyond the development of the individual because he believed development could not be separated from a community or the practices of individuals and others

within it (Palinesar, 1998; Wells, 1999). Vygotsky emphasised the need to concentrate on process rather than product (John-Steiner & Mahn, 1996) and identified four levels of analyses, with different foci operating on different time scales which could be used to study any form of development (Palinesar, 1998; Wells, 1999) (see Chapter 3).

When viewed through Vygotsky's framework, the results of the analyses in this case offer developmental insights about the course and learning activities (microgenesis), individual learners (ontogenesis) and groups within the case (cultural development). The strength of Vygotsky's theory, as predicted, lay in its explanation of the dynamic relationship between individuals and others. The conceptual model of Vygotsky's theoretical constructs was useful as it visually supported the significance of relationships among learners and made it possible to conceive how internalisation and interdependence could coexist as concepts within an integrated theory. It also showed that the consequences of learning relationships had an impact on individuals, others and the community as a whole. The learners sense of community may have had a positive effect on knowledge construction within the course as Wells (1999) suggests that for learning to occur in the ZPD it is not so much a more capable other that is required as a willingness on the part of all participants to learn with and from one another.

Although Vygotsky's constructs were relevant, valuable and useful in understanding the nature and significance of learner-learner interaction and the relationship between individuals and others in online learning contexts, they did not offer an effective means of comprehending the processes of knowledge construction within the course. While it was clear that learners demonstrated the achievement of

higher mental function, this did not explain how knowledge was constructed within online learning groups.

The perceived strength and limitation of Vygotsky's theory in relation to this study may have some theoretical significance. It was asserted, based on the literature review in Chapter 2, that, although social constructivist theories are frequently used as conceptual frameworks in the analyses of interaction and learning in online contexts, the relationship among the theory, mediated communication and knowledge construction is tentative and not fully supported by previous research (Hendriks, 2002; Hendriks & Maor, 2004; Schrire, 2002; Veldhuis-Diermanse, 2002). The analyses in this case illustrate links among Vygotsky's theoretical constructs, online learning contexts, the importance of learner-learner interaction, and the significance of relationships between learners.

It has also been suggested that, even among those who embrace a constructivist paradigm, there has been a reluctance to examine the nature of knowledge constructed and how the processes of learner interaction can be related to the processes of knowledge construction (Bereiter & Scardamalia, 1996). Perhaps the problem lies with the functionality of the theoretical framework rather than unwillingness on the part of researchers to investigate these aspects of the learning process, as in this case Vygotsky's theory alone could not facilitate understanding of the relationship between learner-learner interaction and knowledge construction in online learning contexts.

6.4 Exploring the significance of transformation as a consequence of learning relationships in online contexts

The analyses of learner-learner interaction and knowledge construction within this case revealed that learners gained an increased awareness and

understanding of theoretical concepts, self and others and that personal and collective transformation occurred as a consequence of learning relationships in online contexts. Transformational learning was defined in Chapter 5 as an adult form of metacognitive reasoning, one which involved the development of a more dependable frame of reference for knowledge, skills and competence (Mezirow, 2003). The process is recognised to be “uniquely adult, abstract and idealized, grounded in the nature of human communication” (E. W. Taylor, 2007, p. 173). As a theoretical construct, transformational learning seeks to explain the way adult learning is structured and it has been found to be an effective means of capturing meaning-making processes (E. W. Taylor, 2007). The framework is considered partly developmental (E. W. Taylor, 2007), but unlike Vygotsky’s theory of development, which adopts a historical perspective, transformational learning is associated only with adults. Although there are synergies among transformational learning, the maturity of participants in this study and the research purpose, neither the conceptual relevance nor its significance became fully apparent until learning relationships had been developed as a category and the consequences identified.

Following an updated review of research literature, E. W. Taylor (2007) observed that “Despite, the abundance of studies in the area of fostering transformative learning, key questions raised in previous reviews continue to be overlooked” (p. 187). He asserts there is a need to understand more about the roles and responsibilities of learners when fostering transformative learning and the consequences of transformation for others in the student’s lives (E. W. Taylor, 2007, p. 187). Of the questions alleged to remain unanswered, several could easily apply to student participation in collaborative learning activities and learning relationships in online contexts. For example, E. W. Taylor (2007) asks: Why do some learners

openly engage in the process while others refuse to participate? What can educators do to lessen resistance? Why is a high degree of emphasis given to the autonomous and formal nature of transformative learning when relationships are particularly significant? What is a transformative relationship? Perhaps more significant, in the light of the findings of this study, is that little is known about the potential and the means of online contexts to foster transformative learning and, although progress has been made, there is uncertainty about which methods can be used to recognise the influence of context or how educators may be able to capitalise on context when fostering transformational learning (E. W. Taylor, 2007).

Figure 6.5 illustrates the process and case specific dimensions of personal and collective transformation within the communication course. As a substantive theory, derived from a single case, the consequences of learning relationships in this study are not generalisable to other learning contexts. However, practitioners may be able to utilise this case as an exemplar to understand the role of online contexts, the development of transformational relationships and the process of transformational learning. Comparisons could then be drawn between the findings of this study and other online investigations or instances of transformational learning in other areas of educational practice.

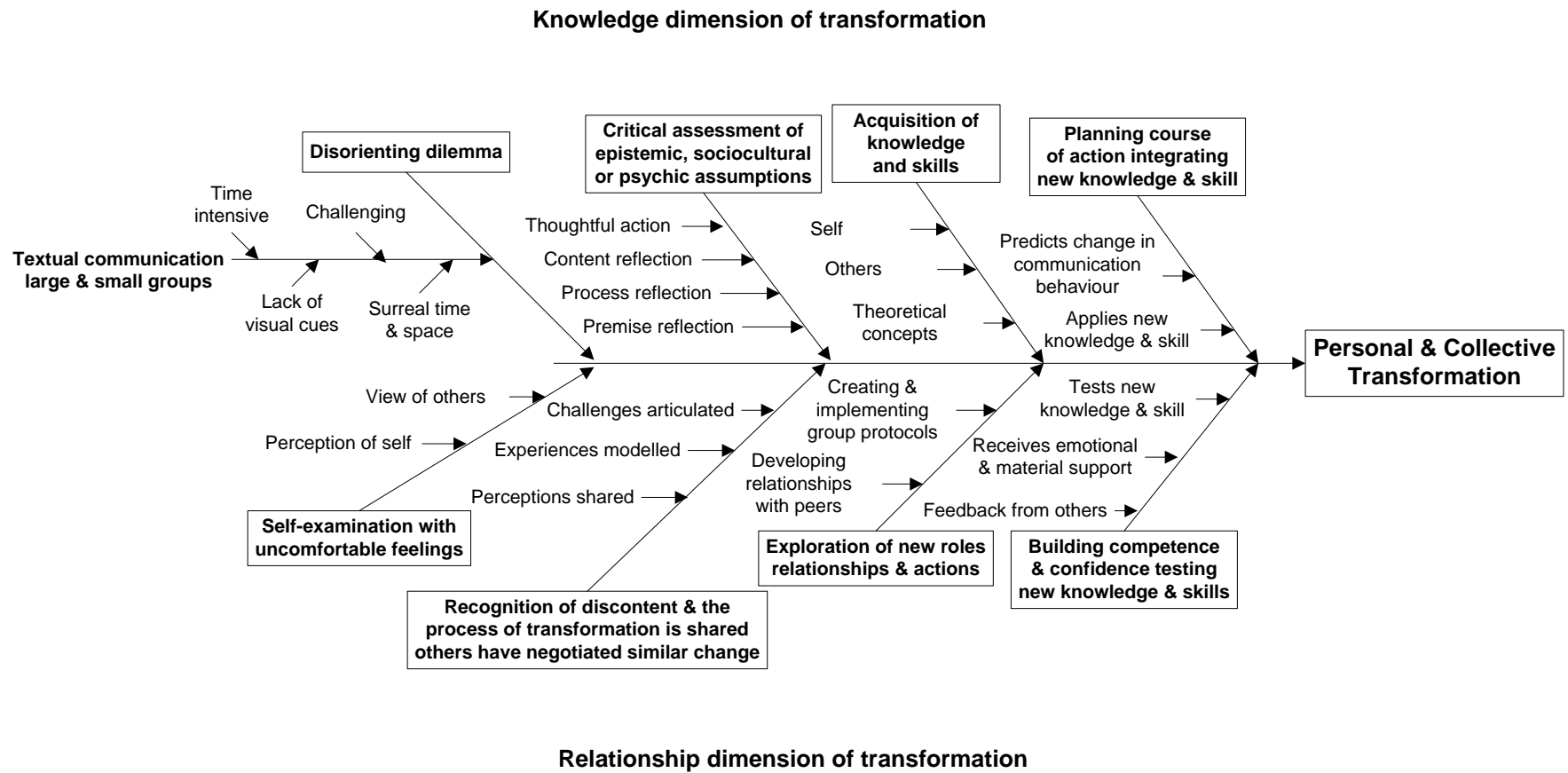


Figure 6.5 The process and case specific dimensions of personal and collective transformation

Within the diagram there are 8 text boxes which incorporate the 10 phases of perspective transformation identified by Mezirow (1991). In order to reflect the process within this study the last box in each dimension combines two phases. The process begins with a disorientating dilemma in the knowledge dimension, which in this case originates with the online learning context. The learners' disorientation is associated with, and related to, their self evaluation in the relationship dimension, brought about by their views of others and perceptions of themselves. Each phase in the knowledge dimension has an associated phase in the relationship dimension. The actions and interactions within each phase were presented in Chapter 5 as they constitute the results of the integrated analyses of learner-learner interaction and knowledge construction. The diagram reflects the individual and social dimensions of transformational learning and has been ordered to illustrate the process of personal and collective transformation that occurred as a result of learning relationships within the course. As the knowledge dimension is individually orientated and the relationship dimension reflects learner-learner interaction within the course, the diagram effectively illustrates the relationship between learner-learner interaction and knowledge construction within this case.

E. W. Taylor (2000) points out that previous transformational studies have, for the most part, been carried out retrospectively with participants being asked to reflect on their transformative experience and that few have observed and recorded the learning experience as it was happening. In this case, the online learning context afforded opportunities to observe the learning experience, the process of transformational learning and the development of transformational relationships within the course and to show subsequently the sequence of events and the relationship between the individual and social dimensions of the process. Although

case specific, knowledge of this kind has implications for educational practice; for example if educators are aware that online learning contexts may be disorientating and have the potential to take students beyond their comfort zone they can be better prepared to meet the needs of individuals and groups by observing, monitoring and supporting learners as the need arises. Moreover, learning activities may be designed to take advantage of this aspect of the online learning context to promote the development of relationships among peers. In this case, learners worked together to overcome the challenges they experienced within the online course and as a result of the process they developed strong connections with members of their learning groups. Also in this course, learning activities were designed to function as triggers for reflection in practice, on practice and with others about communication practice. The reflective and collaborative processes provided learners with access to diverse experiences, knowledge and understandings and opportunities to view and form different perspectives of themselves and others engaged in the course.

The substantive theory constructed from this case suggests that online learning contexts are conducive to the development of relationships with peers and previous research has found relationships with others to be an essential factor in a transformative learning experience. Mezirow (1991) identifies a range of conditions considered essential when fostering transformational learning; those conditions have been confirmed by subsequent research and are further supported by the analyses of this case. The conditions include: a sense of safety, openness and trust; instructional methods that support a learner-centred approach and encourage student autonomy, participation, and collaboration; and learning activities that encourage the exploration of alternative personal perspectives via problem posing and critical reflection (E. W. Taylor, 2000). In fact, the conditions identified by Mezirow lend

additional support for the assertion in this dissertation that within online learning contexts the development of relationships among peers is more important than task orientated interaction.

The fact that online learning contexts can be used effectively to foster transformational learning in first year undergraduate students is also significant. Mezirow (1991) asserts that perception or prereflective learning “...involves our ability to differentiate space, time, direction, dimensions, sequence, entity, focus, states, moods, feelings, and the punctuation (identifying the beginnings and ends) of events” (p. 15) and that this ability becomes modified with experience. This would suggest that with continued exposure learners are likely to become less disorientated in online learning contexts and more accustomed to online learning environments. If the intent is to foster and promote transformational learning throughout an educational program, it may be necessary to devise strategies to facilitate progressive change, thereby adopting a program rather than a course approach to transformational learning.

It was suggested in Chapter 5 that transformational learning is sustainable, as we cannot unlearn what we know about ourselves; this notion is supported by Mezirow (1991), who points out that we do not return to an old perspective once transformation has occurred. Being self aware and cognisant of the learning process and of the value of the contributions of others is likely to facilitate the continued construction and reconstruction of knowledge, which will in turn promote greater understanding and further transformation. Consequently transformational learning in online contexts also offers a means of fostering lifelong learning.

Based on previous research about transformational learning E. W. Taylor (2000) identified four potential foci for future research; these were theoretical

comparisons, in-depth component analysis, strategies for fostering transformative learning and the use of alternative methodological designs. Although unintended, this study contributes in some way to each of these areas. Theoretically, the analyses commenced, sensitised by Vygotsky's theory of development; this conceptual framework provided a valuable means of understanding the process and significance of learner–learner interaction in online learning contexts. Mezirow's (1991) theory of transformational learning was found to be relevant in this case based on the process of knowledge construction, the relationships among peers and the personal and collective transformation that occurred. The phases of the transformative process provided a means of understanding and visualising the relationship between learner-learner interaction and knowledge construction within this case. Methodologically, the single case study with an embedded case design and the use of SNA together with constant comparative method provided comprehensive, integrated analyses of learner interaction and knowledge construction within the communication course. Observation of the learning process within diverse online contexts revealed the role and capacity of online environments and learning relationships to foster personal and collective transformation.

This section illustrated the process and dimensions of transformational learning within the communication course and explored the significance of transformation as a consequence of learning relationships in online contexts. Recognition of the relevance and subsequent use of Mezirow's (1991) theory of transformational learning within this case extends the theoretical contribution of the study. Figure 6.6 illustrates the importance of online contexts, relationships among peers and consequences of transformation for individuals and others in online groups. It also offers an observational view rather than a retrospective report of

transformational learning in online contexts. The use of two compatible, but different, theoretical frameworks constitutes theoretical triangulation, which has been acknowledged to add breadth, depth and rigour to investigations of this type (Stake, 2005). Moreover, the need to utilise a secondary conceptual framework within this study lends support to previous assertions that no single theory or method can adequately explain complex phenomena (L. Cohen & Manion, 1994; Patton, 2002).

6.5 Examining the study's contribution to methodological knowledge

The purpose of this research was to understand the processes of, and the relationship between, learner-learner interaction and knowledge construction within online learning contexts. A series of questions was formulated, based on the social structure of the course, to guide the collection and analyses of data. They were: how do learners interact and construct knowledge within a large, asynchronous discussion group? How do learners interact and construct knowledge within small groups in asynchronous and synchronous environments? How do individual learners conceptualise interaction and knowledge construction within the context of an online course? And in what ways do learner perceptions shape communication and learning in online groups? Two diverse but complementary means were utilised to arrive at an understanding of each process; SNA and constant comparative method.

The results of the investigation led to the construction of a substantive theory about learning relationships in online contexts and the investigation was retrospectively acknowledged as a grounded theory study. The outcome was unexpected as the study had not been designed for this purpose. Even so, the analyses led to the development of learning relationships as a core category and that category forms the basis of the theory. In Chapter 4, it was suggested that the

sustained analyses of the processes of learner-learner interaction and knowledge construction facilitated conceptual understanding. It is also true that the research strategy, which incorporated multiple methods and the analytical procedures of constructivist grounded theory, contributed to theoretical construction.

Triangulation techniques are based on the premise that no single method can adequately solve the problem of rival explanations and that each method reveals different aspects of reality (Denzin, 2009; Patton, 2002). In this study, both data and methods were triangulated. Data were collected from different times, spaces and persons. SNA offered a macro level analysis of the interactions that facilitated knowledge construction within the online course, while constant comparative method provided micro level analyses of the processes of interaction and knowledge construction during asynchronous and synchronous communication, in large and small groups. Although there is support for combining SNA with other qualitative methods to examine interaction and learning in online contexts (Aviv et al., 2003; de Laat et al., 2007; Zhu, 2006), no studies utilising this particular sequence and combination were located within the extant literature.

In this study, the intended function of SNA was the illustration of interactions among learners engaged in collaborative activities. However, the results of the SNA were also found to offer a methodological means of identifying and justifying the selection, and subsequent analyses, of case data from the large number accessible from the electronic archive of the course (Rossi, 2008b). Educational applications of SNA were also identified and these were discussed in section 6.2.

The construct of learning relationships in online contexts is significant because it is derived from results drawn from diverse methods of analyses and multiple sources of data; it is not dependent on either self-reported views or the

actions of learners to comprehend how and why learners behaved in the way that they did in this case. Although novel, the combination of methods, data and theory was effective because it has been possible to understand interactive patterns, explain the processes of learner-learner interaction and knowledge construction and illustrate the relationship between the two within the online communication course.

The theory constructed within this study is acknowledged to be substantive as it evolved from the study of phenomena in one particular case. It is therefore a low-level theory, applicable only to the immediate situation (Glaser & Strauss, 1967). While a substantive theory can be constructed from a comparative analysis between or among groups in a substantive area, a formal theory requires comparative analysis among different kinds of substantive cases (Glaser & Strauss, 1967). Concern within this study has been with the representativeness of concepts and how concepts vary dimensionally rather than with the identification of a representative population sample; this approach was appropriate given that a single case cannot be considered representative of a particular population.

As the transferability of the knowledge and findings from this qualitative research will be determined by readers of the study, one of the challenges for the researcher has been to provide sufficient description to contextualise the study to enable readers to determine the extent to which their situations match the research context (Merriam, 2009). Although the embedded case design and the contextual conditions associated with this course may increase the range and applicability of research results, the researcher in this case has also endeavoured to demonstrate the fit between the substantive theory and formal theories of learning, discussed the implications of the findings and offered examples to show where, when, and how concepts from the substantive theory may be incorporated into educational practice.

6.6 Limitations of the study

While much has been learnt from this research, a number of limitations, associated with the collection and analyses of data, must be acknowledged. In Chapter 4, observation was identified as the predominant method of data collection within this study. Some of the limitations associated with traditional observation were negated by the characteristics of electronic data; for example there was no limitation to the number of interactions or activities that could be observed and computer-mediated observations did not require transcription as the electronic records provided a verbatim account of the interactions that took place online. However, the integrity of some of the static documents, specifically statistical course data, was incomplete. Although this deficit did not impinge significantly on the overall analyses of the case, it does reflect a limitation that is generally associated with documentation in traditional research settings (Patton, 2002).

Access to data was not a limitation within this study but the volume of data that was available was problematic. Even although SNA provided a methodological means of selecting which data to analyse further, both SNA and constant comparative method are recognised to be labour intensive and time consuming (de Laat et al., 2007). In this case, data from different weeks during the term were chosen to obtain an historical perspective of the phenomena and a snapshot of interaction and knowledge construction at different times in the course. As evidenced by earlier discussion, it was possible to determine the general processes of learner-learner interaction and knowledge construction from the data collected; however, little insight was gained from viewing individual contributions in particular weeks, as when isolated in this way the data lacked context. Furthermore, attention in this study was focused on the relationship between learner-learner interaction and knowledge

construction; the remaining five (out of a total of six identified forms of interaction) were not closely examined.

A number of limitations were also associated with the methods of analyses. Although the InFlow program was visually and statistically useful in the analysis of learner-learner interaction in the large group, it did not fully meet the needs of this study as system logs were utilised to view links between members of small groups. In addition, while links could be drawn between learners, the content of learner interaction had to be discerned and analysed by other means.

A delimiting factor of grounded theory is that only those aspects related to the core category are included in the theory. In this case, this excluded discussion of the roles that different learners played within learning groups, the role of the educator during implementation of the course and interaction between the educator and learners during the 12 week term.

6.7 Future research

If research and practical experience are to come together in some significant mutually fruitful relationship then educators must critically examine how research can contribute directly to the problems of teaching. (Nuthall, 2004, p. 274)

Discussion in previous sections has for the most part revolved around the significance of this research, its contribution to knowledge and its implications for educational practice. However, as this study was founded on educational practice, the experience derived from this investigation may also be used to inform future research.

A number of directions for future research have been proposed within this dissertation, emerging from the integrated analyses, limitations in the scope of this study and constraints upon the researcher's time. For example in Chapter 5 questions were raised about whether online contexts could be considered as deceptive in

relation to perceptions of time as they are in relation to perceptions of safety. Alternatively, does the lack of visual cues in textual communication disorientate learner perceptions of time and space? Moreover, do learner perceptions of disconnection promote the development of relationships among peers within online learning contexts? Further examination of student perceptions and an investigation of the use and management of time by individuals and groups may provide some answers to these questions.

As learners utilised synchronous communication more frequently than required within this course, attention was drawn to the potential role and significance of synchronous communication in the development of relationships among peers in learning groups (see subsection 5.6.2.4). Similarities have also been drawn between synchronous communication and speech in online contexts (see subsection 5.7.2.4). It has also been asserted within this dissertation that learning relationships, more than interaction, promote the development of learning communities within online contexts. Given that previous research suggests that synchronous communication contributes more to community building than asynchronous communication (Haythornthwaite et al., 2000), a number of questions arise. Has the significance of relationships among learners been subsumed by the concept of community development in previous research? Are the terms “learning relationships” and “learning communities” synonymous? Is synchronous communication a more effective means of developing relationships with peers in learning groups than asynchronous communication?

Given the limitations of this study, future research may also examine the relationship between other forms of interaction and knowledge construction in online contexts; specifically learner-content and learner-student interaction, the roles of

learners within online learning groups and the role of educators in online contexts when context, learning and interaction are learner-centred.

6.8 Conclusion

This chapter discussed the significance of the study and the educational implications of learning relationships as a theoretical construct by locating the study and the results within the substantive area of online learning, evaluating the relevance of Vygotsky's theory of development as a conceptual framework and exploring the importance of transformation as a consequence of learning relationships in online contexts. It also examined the study's contribution to methodological knowledge, the limitations of the research and potential directions for future research.

Figure 6.7 offers a visual overview of this investigation. The study was undertaken to understand the relationship between learner-learner interaction and knowledge construction in online contexts. The results of the integrated analyses led to the development of learning relationships as a core category and a substantive theory about learning relationships in online contexts. Within this case, textual communication and group interaction led to perceptions of a positive sense of place which was conducive to learner participation in collaborative learning activities, the development of open relationships among peers and a sharing, dialogic approach to learning. The actions and interactions of learners, in response to conditions within the course, promoted a sense of community, facilitated increased knowledge and understanding of self and others, and led to personal and collective transformation. What is significant, in terms of educational practice, is that learners within this study were engaged in a first year, undergraduate online communication course and that relationships were formed and change occurred within a twelve week academic term.



Figure 6.6 Overview of the research study

6.9 Reflection on and articulation of personal transformation

If people can understand their own perspectives, as well as those of others, they can not only understand their past but they can also make predictions about their likely behaviour in a given situation, such as the classroom, because they know something about what that series of events is likely to mean to themselves and others. (Diamond, 1991, p. 22)

At the beginning of this dissertation I described myself as an adult learner and reflective practitioner in continual pursuit of personal and professional development. I acknowledged that my interests and motivations in this investigation were both intrinsic and instrumental, locating the study within “a zone of combined purpose” (Stake, 2005, p. 445). The aim of the research was to understand the processes of, and the relationship between, learner-learner interaction and knowledge construction in online contexts, specifically within collaborative learning groups of different sizes communicating synchronously and asynchronously. My intention, in terms of outcomes, was to contribute to a range of knowledge about online learning and to understand conditions for effective interaction and learning in online courses. I anticipated that this knowledge would contribute to and enhance my teaching practice, the instructional design of future online courses and the collaborative learning experience of future students. However, this research has surpassed all expectations and I must admit that I am at times astounded by the breadth, depth and value of this learning experience.

Earlier, I drew a comparison between the actions of learners within the online course and my own efforts to integrate and test the knowledge I had constructed from my analyses of the case. This is, however, only one of several parallels. With so many theoretical, methodological and metacognitive “Aha” moments I am compelled to acknowledge my experience as a learner within this investigation and, while it is neither feasible nor appropriate to attempt to convey all that I have learnt, I am

particularly intrigued that I too experienced perspective transformation. Figure 6.7 offers an adaptation of the diagram created to illustrate the process of personal and collective transformation of learners within the online course; its use represents an effort to reflect my experience and to demonstrate further application of the diagram as a tool through which to view transformational learning.

My interest in this research originated from educational practice, specifically from the development and implementation of two previous offerings of the online communication course. Figure 6.7 identifies several contradictory factors which constituted a disorientating educational dilemma, acknowledged in Chapter 1 as intrinsic interest in the study. As previously explained the course had been redesigned to promote interaction through online collaborative activities and despite early concern I came to believe that an appropriately structured online course could enhance the learning of students in a distance education communication course. Although interaction is acknowledged to be significant within the learning process, students invariably raised concerns about the time commitment necessary to fulfil online course requirements. In the initial offering, students were openly hostile, yet recognised the value of interactions with peers. As course co-ordinator I was cognisant of the visibility of student exchanges and the extent to which learners were able to demonstrate knowledge and understanding within online contributions (Rossi & Hinton, 2005). Although my observations were supported by research which suggested that interactions in asynchronous environments may be of greater intellectual quality than those that take place face-to-face (Ladyshevsky, 2004), there were divergent opinions about the capacity and application of online learning contexts from both academics and health care professionals. There was also a contention that systems such as Blackboard did not lend themselves to student-

centred teaching and learning approaches (Blacker, 2005), which was contrary to my experience and led me to question the value of learner-learner interaction in online contexts.

As a learner, I perceived myself to be self-directed and independently orientated, seeking knowledge that met a personal and/or professional need and preferring to work alone to avoid distractions and to allow myself time to grasp fully new concepts (which is interesting given the interactive nature of the online course I developed for others). However, from this experience, I have come to appreciate that my independence is in fact dependent on others. In this investigation ‘others’ were represented by theorists, researchers and academics who had articulated knowledge and experience within educational literature. I was able to make connections between theoretical concepts and my own experience, emulating the behaviour of learners within the course, and use my knowledge and experience to evaluate the experience and knowledge of ‘others’. In this way knowledge that had been shared was personalised (internalised) and recycled as my knowledge, experience and understanding increased. Now I must acknowledge that I am not as independent as I thought I was and that Vygotsky’s (1981) concept of interdependence reflects and explains certain elements of my learning process.

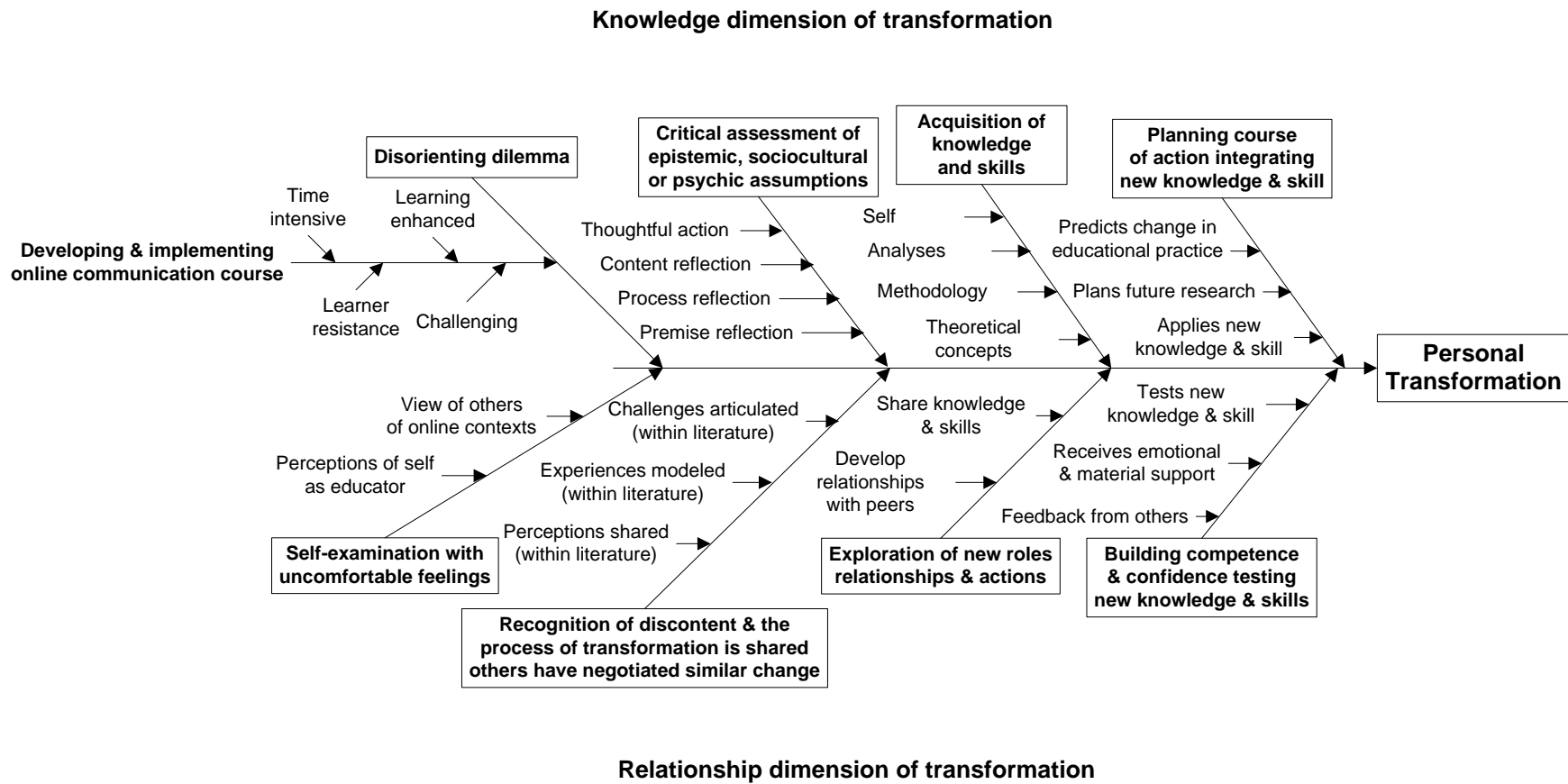


Figure 6.7 Process and dimensions of the personal transformation of the researcher

Interestingly, Anderson asserts that theory

...makes it possible for us to view our practice and our research from a broader perspective than envisioned from the murky trenches of our practice. This broader perspective helps us make connections with the work of others, facilitates coherent frameworks and deeper understanding of our actions, and perhaps most importantly, allows us to transfer the experience gained in one context to new experiences and contexts. (Anderson, 2008b, p. 45)

Theoretical frameworks have undoubtedly served as tools to understand and visualise learner interaction and knowledge construction within this investigation; however, meaning has been made through a process of internalisation and the connections made between knowledge and experience. The transferability of experience is therefore possible only if it has meaning, in much the same way that research findings are transferable if the reader can relate them to their own area of practice. In this study, I “awakened to” an aspect of the other (Witz, 2007) as I could see myself reflected in the experience of learners within the course. From this investigation I have developed a broad range of knowledge and skills including knowledge of theoretical concepts, methodology, analyses and self (see Figure 6.7). The significance of this knowledge is that it is grounded in experience and has personal meaning, which enhances its value and transferability. If one were to view my experience, illustrated in Figure 6.7, as one learning event in a series of many it is relatively easy to perceive learning as an historical, continuous, dynamic, intrapersonal, interactive and potentially transformational process.

References

- Ackermann, E. (1995). Construction and transference of meaning through form. In L. P. Steffe & J. Gale (Eds.), *Constructivism in education* (pp. 341-354). Hillsdale, NJ: Erlbaum.
- Adler, R. B., & Rodman, G. (2003). *Understanding communication* (8th ed.). New York: Oxford University Press.
- Allen, I. E., & Seaman, J. (2007). *Online Nation: Five years of growth in online learning*. Needham, MA: Sloan Consortium.
- Ally, M. (2008). Foundations of educational theory for online learning. In T. Anderson (Ed.), *The theory and practice of online learning* (2nd ed., pp. 15-44). Edmonton, AB: Athabasca University Press.
- Anderson, T. (2003). Getting the mix right: An updated and theoretical rationale for interaction. *International Review of Research in Open and Distance Learning*, 4(2). Retrieved October 14, 2009, from <http://www.irrodl.org/index.php/irrodl/article/view/149/230>
- Anderson, T. (2004). Toward a theory of online learning. In T. Anderson & F. Elloumi (Eds.), *Theory and practice of online learning* (pp. 33-60). Edmonton, AB: Athabasca University Press.
- Anderson, T. (2008a). Introduction. In T. Anderson (Ed.), *The theory and practice of online learning* (2nd ed., pp. 1-14). Edmonton, AB: Athabasca University Press.
- Anderson, T. (2008b). Towards a theory of online learning. In T. Anderson (Ed.), *The theory and practice of online learning* (2nd ed., pp. 45-74). Edmonton, AB: Athabasca University Press.
- Anderson, T., & Garrison, D. R. (1998). Learning in a networked world: New roles and responsibilities. In C. Gibson (Ed.), *Distance learners in higher education: Institutional responses for quality outcomes* (pp. 97-112). Madison, WI: Atwood.
- Anderson, T., Rourke, L., Garrison, D. R., & Archer, W. (2001). Assessing teaching presence in a computer conferencing context. *Journal of Asynchronous Learning Networks*, 5(2), 1-17.
- Andrews, T., & Crock, M. (1996). Putting the pieces of the puzzle together: Preparing students and staff for changes in educational environments. In S. Gregor & D. Oliver (Eds.), *Proceedings: Processes of community change* (pp. 195-202). Rockhampton, Australia: Central Queensland University.
- Andrusyszyn, M. A., & Davie, L. (1997). Facilitating reflection through interactive journal writing in an online graduate course: A qualitative study. *Journal of*

- Distance Education*, 12(1), 103-126. Retrieved November 9, 2009, from the Directory of Open Access Journals database.
- Ash, S. L., & Clayton, P. H. (2004). The articulated learning: An approach to guided reflection and assessment. *Innovative Higher Education*, 29(2), 137-154. Retrieved October 16, 2008, from the SpringerLink database.
- Australian Government, Department of Education, Employment and Workplaces Relations (DEEWR) (2008). Digital Education Revolution, Commonwealth of Australia. Retrieved January 18, 2010, from <http://www.digitaleducationrevolution.gov.au>
- Aviv, R., Erlich, Z., Ravid, G., & Geva, A. (2003). Network analysis of knowledge construction in asynchronous learning networks. *Journal of Asynchronous Learning Networks*, 7(3), 1-23.
- Bartolic-Zlomisljic, S., & Bates, A. W. (1999). Investing in online learning: Potential benefits and limitations. *Canadian Journal of Communication*, 23(3). Retrieved September 24, 2008, from the ProQuest database.
- Bates, A. W. (1990). *Interactivity as a criterion for media selection in distance education*. Paper presented at the annual conference of the Asian Association of Open Universities, Jakarta, Indonesia.
- Baym, N. K. (1995). The emergence of community in computer-mediated interaction. In S. G. Jones (Ed.), *Cybersociety: Computer-mediated communication and community* (pp. 138-163). Thousand Oaks, CA: Sage.
- Beaudoin, M. F. (2002). Learning or lurking? Tracking the "invisible" online student. *The Internet and Higher Education*, 5(2), 147-155. Retrieved January 17, 2010, from the ScienceDirect database.
- Beldarrain, Y. (2006). Distance education trends: Integrating new technologies to foster student interaction and collaboration. *Distance Education*, 27(2), 139-153. Retrieved December 7, 2009, from the InformaWorld database.
- Bell, M., Bush, D., Nichololson, P., O'Brien, D., & Tran, T. (2002). *Universities online: A survey of online education and services in Australia*. Retrieved April 6, 2010, from Department of Education Science and Training (DEST) Web site: http://www.dest.gov.au/sectors/higher_education/publications_resources/profiles/online_education_services_in_australia.htm.
- Bereiter, C., & Scardamalia, M. (1996). Rethinking learning. In D. R. Olson & N. Torrance (Eds.), *The handbook of education and human development: New models of learning teaching and schooling* (pp. 485-513). Cambridge, MA: Blackwell.
- Berge, Z. L. (1999). Interaction in post-secondary web-based learning. *Educational Technology*, 39(1), 5-11.

- Beuchot, A., & Bullen, M. (2005). Interaction and interpersonality in online discussion forums. *Distance Education*, 26(1), 67-87. Retrieved September 24, 2006, from the ProQuest database.
- Billings, D. M. (2000). A framework for assessing outcomes and practices in Web-based courses in nursing. *Journal of Nursing Education*, 39(2), 60-67.
- Blacker, G. (2005). Moodling around in anger - some initial reflections. Retrieved January 18, 2005, from http://www.bath.ac.uk/dacs/cdntl/pMachine/morriblog_more.php?id=370_0_4_0_M
- Böhm, A. (2004). Theoretical coding: Text analysis in grounded theory. In U. Flick, E. von Kardoff & I. Steinke (Eds.), *A companion to qualitative research* (pp. 270-275). London: Sage.
- Boud, D., Keogh, R., & Walker, D. (1985). Promoting reflection in learning: A model. In D. Boud, R. Keogh & D. Walker (Eds.), *Reflection: Turning experience into learning* (pp. 18-40). London: Kogan Page.
- Brandt, C. (2008). Integrating feedback and reflection in teacher preparation. *ELT Journal*, 62(1), 37-46. Retrieved January 4, 2010, from the IngentaConnect database.
- Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (1999). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.
- Brook, C., & Oliver, R. (2003). Online learning communities: Investigating a design framework. *Australasian Journal of Educational Technology*, 19(2), 139-160.
- Brown, R. E. (2001). The process of community-building in distance learning classes. *Journal of Asynchronous Learning Networks*, 5(2), 18-35.
- Bruner, J. (1985). Vygotsky: A historical and conceptual perspective. In J. V. Wertsch (Ed.), *Culture, communication, and cognition: Vygotskian perspectives* (pp. 21-34). England: Cambridge University Press.
- Buckingham Shum, S. (1999). 'Knowledge technologies' Course 11B823 *Managing Knowledge*. Milton Keynes, England: Open University Press.
- Bullen, M. (1998). Participation and critical thinking in online university distance education. *Journal of Distance Education*, 13(2), 1-32.
- Canning, C. (1991). What teachers say about reflection. *Educational Leadership*, 48(6), 18-21. Retrieved January 8, 2010, from the ProQuest database.
- Chang, A. E. (2002). *The efficacy of online learning in the promotion of critical thinking in graduate education*. Unpublished doctoral dissertation, Columbia University, New York.

- Charmaz, K. (2000). Grounded theory: Objectivist and constructivist methods. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 509-535). Thousand Oaks, CA: Sage.
- Charmaz, K. (2005). Grounded theory in the 21st century: Applications for advancing social justice studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 507-535). Thousand Oaks, CA: Sage.
- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Thousand Oaks, CA: Sage.
- Cho, H.-C., Trier, M., & Kim, E. (2005). The use of instant messaging in working relationship development: A case study. *Journal of Computer-Mediated Communication*, 10(4). Retrieved July 30, 2009, from the Wiley InterScience Journals database.
- Chou, C.-T. C. (2002). *A comparative content analysis of student interaction in synchronous and asynchronous learning networks*. Paper presented at the 35th Hawaii international conference on system sciences. Retrieved January 6, 2006, from <http://doi.ieeecomputersociety.org/10.1109/HICSS.2002.994093>
- Clarke, A. E. (1998). *Disciplining reproduction: Modernity, American life sciences, and the problems of sex*. Berkeley, CA: University of California Press.
- Clarke, A. E. (2003). Situational analyses: Grounded theory mapping after the postmodern turn. *Symbolic Interaction*, 26(4), 553-576
- Clarke, A. E. (2005). *Situational analysis*. Thousand Oaks, CA: Sage.
- Cobb, P. (2005). Where is the mind? A coordination of sociocultural and cognitive constructivist perspectives. In C. T. Fosnot (Ed.), *Constructivism: Theory Perspectives and Practice* (pp. 39-57). New York: Teachers College Press.
- Cohen, E. (1994). Restructuring the classroom: Conditions for productive small groups. *Review of Educational Research*, 64(1), 1-35. Retrieved November 12, 2009, from the ProQuest database.
- Cohen, L., & Manion, L. (1994). *Research methods in education* (4th ed.). London: Routledge.
- Cole, M. (1995). Socio-cultural-historical psychology: Some general remarks and a proposal for a new kind of cultural-genetic methodology. In J. Wertsch, P. Del Rio & A. Alvarez (Eds.), *Sociocultural studies of mind* (pp. 187-214). England: Cambridge University Press.

- Cole, M., & Engerstrom, Y. (1993). A cultural-historical approach to distributed cognition. In G. Salomon (Ed.), *Distributed cognitions: Psychological and educational considerations* (pp. 1-46). England: Cambridge University Press.
- Confrey, J. (1995). How compatible are radical constructivism sociocultural approaches and social constructivism. In L. P. Steffe & J. Gale (Eds.), *Constructivism in education* (pp. 185-225). Hillsdale, NJ: Erlbaum.
- Corbin, J., & Strauss, A. (1990). Grounded theory method: Procedures canons and evaluative criteria. *Qualitative Sociology*, 13(1), 3-21.
- Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Thousand Oaks, CA: Sage.
- Crain, W. (2005). *Theories of development: Concepts and applications*. Upper Saddle River, NJ: Pearson Education.
- Creswell, J. W. (2003). *Research design: Qualitative quantitative and mixed method approaches* (2nd ed.). Thousand Oaks, CA: Sage
- Curtis, D. D., & Lawson, M. J. (2001). Exploring collaborative online learning. *Journal of Asynchronous Learning Networks*, 5(1), 21-34.
- Daloz, L. A. P. (2000). Transformative learning for the common good. In J. Mezirow & Associates (Eds.), *Learning as transformation: Critical perspectives on a theory in progress* (pp. 103-124). San Francisco: Jossey-Bass.
- Daniels, H. (2001). *Vygotsky and pedagogy*. London: RoutledgeFalmer.
- Daradoumis, T., Martinez-Mones, A., & Xhafa, F. (2004). An integrated approach for analysing and assessing the performance of virtual learning groups. In G.-J. de Vreede, L. A. Guerrero & G. M. Raventos (Eds.), *Groupware: Design implementation and use: 10th International workshop, CRIWG 2004, San Carlos, Costa Rica, September 2004. Proceedings* (pp. 289-404): Springer.
- Davis, M., & Rouzie, A. (2002). Cooperation vs deliberation: Computer mediated conferencing and the problem of argument in international distance education. *International Review of Research in Open and Distance Learning*, 3(1). Retrieved August 15, 2006, from <http://www.irrodl.org/index.php/irrodl/article/view/82/159>
- de Laat, M., Lally, V., Lipponen, L., & Simons, R.-J. (2007). Investigating patterns of interaction in networked learning and computer-supported collaborative learning: A role for Social Network Analysis. *International Journal of Computer-Supported Collaborative Learning*, 2(1), 87-103.
- Del Rio, P., & Alvarez, A. (2007). Inside and outside the zone of proximal development: An ecofunctional reading of Vygotsky. In H. Daniels, M. Cole & J. V. Wertsch (Eds.), *Cambridge companion to Vygotsky* (pp. 276-305). England: Cambridge University Press.

- Denzin, N. K. (1997). Triangulation in educational research. In J. P. Keeves (Ed.), *Educational research methodology and measurement: An international handbook* (2nd ed., pp. 318-322). Oxford, England: Elsevier
- Denzin, N. K. (2009). *The research act: A theoretical introduction to sociological methods*. Chicago, IL: Aldine.
- Denzin, N. K., & Lincoln, Y. S. (2005). Introduction: The discipline and practice of qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 1-32). Thousand Oaks, CA: Sage.
- DeVito, J. A. (2004). *The interpersonal communication book* (10th ed.). Boston, MA: Pearson.
- Diamond, C. T. P. (1991). *Teacher education as transformation: A psychological perspective*. Milton Keynes, England: Open University Press.
- Downes, S. (2004). Learning in communities. *Australian Flexible Learning Community*. Retrieved December 9, 2009, from <http://www.downes.ca/cgi-bin/page.cgi?post=6880>
- Driscoll, M. P. (1994). *Psychology of learning for instruction*. Boston, MA: Allyn & Bacon.
- Feld, S. L. (1981). The focused organisation of social ties. *American Journal of Sociology*, 86(5), 1015-1035.
- Fosnot, C. T. (2005a). Epilogue. In C. T. Fosnot (Ed.), *Constructivism: Theory, perspectives, and practice* (2nd ed., pp. 267-291). New York: Teachers College Press.
- Fosnot, C. T. (2005b). Preface. In C. T. Fosnot (Ed.), *Constructivism: Theory, perspectives, and practice* (2nd ed., pp. ix-xii). New York: Teachers College Press.
- Fosnot, C. T., & Perry, R. S. (2005). Constructivism: A psychological theory of learning. In *Constructivism: Theory, perspectives, and practice* (2nd ed., pp. 8-38). New York: Teachers College Press.
- Gabarro, J. (1990). The development of working relationships. In J. Galegher, R. E. Kraut & C. Egido (Eds.), *Intellectual teamwork: Social and technical foundations of cooperative work* (pp. 79-110). Hillsdale, NJ: Erlbaum.
- Garrison, D. R. (1997). Computer conferencing: The post-industrial age of distance education. *Open Learning*, 12(2), 3-11.
- Garrison, D. R. (2000). Theoretical challenges for distance education in the 21st century: A shift from structural to transactional issues. *International Review*

of Research in Open and Distance Learning, 1(1), 1-17. Retrieved November 28, 2009, from the Directory of open access journals database.

- Garrison, D. R. (2009). Implications of online learning for the conceptual development and practice of distance education. *Journal of Distance Education*, 23(2), 93-104. Retrieved November 9, 2009, from the Directory of Open Access Journals database.
- Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2-3), 87-105. Retrieved December 3, 2009, from the ScienceDirect database.
- Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence and computer conferencing in distance education. *American Journal of Distance Education*, 15(1), 7-23.
- Garrison, D. R., & Arbaugh, J. B. (2007). Researching the community of inquiry framework: Review issues and future directions. *The Internet and Higher Education*, 10(3), 157-172. Retrieved December 4, 2009, from the ScienceDirect database.
- Garrison, D. R., & Archer, W. (2007). A theory of community of inquiry. In M. G. Moore (Ed.), *The handbook of distance education* (2nd ed., pp. 77-88). Mahwah, NJ: Erlbaum.
- Ghaye, A., & Ghaye, K. (1998). *Teaching and learning through critical reflective practice*. London: David Fulton Publishers.
- Gibbs, G. R. (2002). *Qualitative data analysis*. Maidenhead, England: Open University Press.
- Glaser, B. G. (1978). *Theoretical sensitivity*. Mill Valley, CA: Sociology Press.
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago, IL: Aldine.
- Gold, S. (2001). A constructivist approach to online training for online teachers. *Journal of Asynchronous Learning Networks*, 5(1), 35-57.
- Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today*, 24, 105-112.
- Guba, E. G., & Lincoln, Y. S. (2005). Paradigmatic controversies, contradictions and emerging confluences. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 191-215). Thousand Oaks, CA: Sage.

- Gunawardena, C. N. (1995). Social presence theory and implications for interaction and collaborative learning in computer conferences. *International Journal of Educational Telecommunications*, 1(2/3), 147-166.
- Gunawardena, C. N., Lowe, C. A., & Anderson, T. (1997). Analysis of a global online debate and the development of an interaction analysis model for examining social construction of knowledge in computer conferencing. *Journal of Educational Computing Research*, 17(4), 397-431.
- Gunawardena, C. N., Nolla, A. C., Wilson, P. L., Lopez-Islas, J. R., Ramirez-Angel, N., & Megchun-Alpizare, R. M. (2001). A cross-cultural study of group process and development in online conferences. *Distance Education*, 22(1), 85-121. Retrieved January 25, 2004, from the ProQuest database.
- Halliday, M. A. K., & Hasan, R. (1985). *Language context and text: Aspects of language in a social-semiotic perspective*. Geelong, VIC, Australia: Deakin University.
- Hara, N., Bonk, C. J., & Angeli, C. (2000). Content analysis of online discussion in an applied educational psychology course. *Instructional Science*, 28, 115-152.
- Haythornthwaite, C. (2001). Exploring multiplexity: Social network structures in a computer-supported distance learning class. *The Information Society*, 17, 211-226.
- Haythornthwaite, C., & Aviv, R. (2005). Collaboration issues in small distributed groups. Retrieved August 13, 2007, from http://leep.lis.uiuc.edu/publish/haythorn/Papers/HaythornthwaiteAviv_CollabSmallGroups_Sloan05.doc
- Haythornthwaite, C., Kazmer, M. M., & Robins, J. (2000). Community development among distance learners: Temporal and technical dimensions. *Journal of Computer-Mediated Communication*, 6(1). Retrieved September 24, 2007, from <http://jcmc.indiana.edu/vol6/issue1/haythornthwaite.html>
- Haythornthwaite, C., & Wellman, B. (2002). The internet in everyday life: An introduction. In B. Wellman & C. Haythornthwaite (Eds.), *The internet in everyday life* (pp. 3-41). Malden, MA: Blackwell
- Hendriks, V. (2002). *Implications of social constructivist theory for students' construction of knowledge through computer-mediated communications*. Unpublished doctoral dissertation, Curtin University of Technology, Bentley, WA.
- Hendriks, V., & Maor, D. (2004). Quality of students' communicative strategies delivered through computer-mediated communications. *Journal of Interactive Learning Research*, 15(1), 5-32.

- Henri, F. (1992). Computer conferencing and content analysis. In A. R. Kaye (Ed.), *Collaborative learning through computer conferencing: The Najaden papers* (pp. 117-136). Berlin: Springer-Verlag.
- Hewson, C. (2007). Gathering data on the internet: Qualitative approaches and possibilities for mixed methods and research. In A. N. Joinson, K. Y. A. McKenna, T. Postmes & U.-D. Reips (Eds.), *The Oxford handbook of internet psychology* (pp. 405-428). Oxford, England: Oxford University Press.
- Hewson, L., & Hughes, C. (2005). Social processes and pedagogy in online learning. *AACE Journal*, 13(2), 99-125.
- Hill, J. L. (1996). Psychological sense of community: Suggestions for future research. *Journal of Community Psychology*, 24(4), 431-438.
- Hillman, D. C. A., Willis, D. J., & Gunawardena, C. N. (1994). Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners. *The American Journal of Distance Education*, 8(2), 30-42.
- Hiltz, S. R., Coppola, N., Rotter, N., Turoff, M., & Benbunan-Fich, R. (1999). Measuring the importance of collaborative learning for the effectiveness of ALN: A multi-measure multi-method approach. *Journal of Asynchronous Learning Networks*, 4(2). Retrieved September 29, 2000, from http://www.sloan-c.org/publications/JALN/v4n2/v4n2_hiltz.asp
- Hodgins, H. W. (2000). *Into the future a vision paper*. Retrieved January 6, 2009, from <http://www.learnativity.com/download/MP7.PDF>.
- Hogan, D. M., & Tudge, J. R. H. (1999). Implications of Vygotsky's theory for peer learning. In A. M. O'Donnell & A. King (Eds.), *Cognitive perspectives on peer learning* (pp. 39-65). Mahwah, NJ: Erlbaum.
- Howe, K. H., & Berv, J. (2000). Constructing constructivism, epistemological and pedagogical. In D. C. Phillips (Ed.), *Constructivism in education: Opinions and second opinions on controversial issues* (pp. 19-40). Chicago, IL: The National Society for the Study of Education.
- Howe, K. R. (2003). *Closing methodological divides: Toward democratic educational research*. Dordrecht, Netherlands: Kluwer Academic.
- Howell-Richardson, C., & Mellar, H. (1996). A methodology of patterns of participation within computer mediated communication courses. *Instructional Science*, 24(1), 47-69. Retrieved June, 15 2009, from the SpringerLink database.
- Hung, D., Tan, S.-C., & Koh, T.-S. (2006). From traditional to constructivist epistemologies: A proposed theoretical framework based on activity theory for learning communities. *Journal of Interactive Learning Research*, 17(1), 37-55. Retrieved December 28, 2007, from the ProQuest database.

- Jeong, A. C. (2003). The sequential analysis of group interaction and critical thinking in online threaded discussions. *American Journal of Distance Education*, 17(1), 25-43. Retrieved August 22 2008, from the InformaWorld database.
- John-Steiner, V., & Mahn, H. (1996). Sociocultural approaches to learning and development: A Vygotskian framework. *Educational Psychologist*, 31(3/4), 191-206.
- Jonassen, D., Davidson, M., Collins, M., Campbell, J., & Haag, B. B. (1995). Constructivism and computer-mediated communication in distance education. *The American Journal of Distance Education*, 9(2), 7-26.
- Kanuka, H. (2002). A principled approach to facilitating diverse strategies for web-based distance education. *Journal of Distance Education*, 17(2), 71-87.
- Kanuka, H., & Anderson, T. (1998). Online social interchange discord and knowledge construction. *Journal of Distance Education*, 13(1), 57-75.
- Kanuka, H., & Anderson, T. (1999). Using constructivism in technology-mediated learning: Constructing order out of the chaos in the literature. *Radical Pedagogy*, 2(1). Retrieved December 21, 2009, from the Directory of Open Access Journals database.
- Karagiorgi, Y., & Symeou, L. (2005). Translating constructivism into instructional design: Potential and limitations. *Educational Technology & Society*, 8(1), 17-27.
- Keeves, J. P., & Sowden, S. (1997). Descriptive data, analysis of. In J. P. Keeves (Ed.), *Educational research methodology and measurement: An international handbook* (2nd ed., pp. 296-306). Oxford, England: Elsevier.
- Kilpatrick, S., Barrett, M., & Jones, T. (2003). *Defining learning communities*. Paper presented at the joint conference of the New Zealand Association for Research in Education and the Australian Association for Research in Education, Auckland, New Zealand.
- Kilpatrick, S., & Bound, H. (2002). Delivering online in regional Australia. *Proceedings of the 5th annual conference of the Australian VET Research Association Conference (AVETRA): Innovation, internationalisation, new technologies and VET, 20-22 March 2002*. Retrieved August 18, 2007, from http://www.avetra.org.au/abstracts_and_papers_2002/kilpatrick-bound.pdf
- Kilpatrick, S., & Bound, H. (2003). *Learning online: Benefits and barriers in regional Australia - Volume 1*. Adelaide, SA: National Centre for Vocational Education Research.
- King, K. P. (2002). Educational technology professional development as transformative learning opportunities. *Computers & Education*, 39(3), 283-297. Retrieved September 23, 2006, from the ScienceDirect database.

- Klooster, D., J. . (2001). What is critical thinking? *The Thinking Classroom*, 4 (Spring), 36-40.
- Knapp, M. (1984). *Interpersonal communication and human relationships*. Boston, MA: Allyn & Bacon.
- Knowles, M. (1990). *The adult learner: A neglected species* (4th ed.). Houston, TX: Gulf Publishing.
- Kofoed, J. (2004). Can students improve performance by clicking more? Engaging students through online delivery. *Studies in Learning Evaluation Innovation and Development*, 1(2), 9-18.
- Krebs, V. E. (2005). InFlow 3.1 (TM) (Version 3.1) [Student Edition].
- Krippendorff, K. (1980). *Quantitative content analysis: An introduction to its method*. Beverly Hills, CA: Sage
- Kumpulainen, K., & Mutanen, M. (1999). The situated dynamics of peer group interaction: An introduction to an analytical framework. *Learning and Instruction*, 9, 449-473. Retrieved July 18, 2006, from the ScienceDirect database.
- Kumpulainen, K., & Mutanen, M. (2000). Mapping the dynamics of peer group interactions: A method of analysis of socially shared learning processes. In H. Cowie & G. van der Aalsvoort (Eds.), *Social interaction in learning and instruction* (pp. 144-160). Amsterdam: Pergamon.
- Ladyshevsky, R. K. (2004). E-Learning compared with face to face: Differences in the academic achievement of postgraduate business students. *Australasian Journal of Educational Technology*, 20(3), 316-336.
- Lally, V., & De Laat, M. (2002). Cracking the code: Learning to collaborate and collaborating to learn in a networked environment. In G. Stahl (Ed.), *Computer support for collaborative learning: Foundations for a CSCL community: Proceedings of the Computer-supported Collaborative Learning 2002 conference* (pp. 160-168). Hillsdale, NJ: Erlbaum.
- Leasure, A. R., Davis, L., & Theivon, S. L. (2000). Comparison of student outcomes and preferences in a traditional vs. world wide web based baccalaureate nursing research course. *Journal of Nursing Education*, 39(4), 149-158.
- Levin, J. (2005). The shape of synchronous online text interaction: Implications for weaving multiple coordinated threads of educational interaction. Retrieved November 2, 2007, from <http://tepservers.ucsd.edu/~jlevin/levin-thread-analysis.pdf>
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.
- Lipponen, L. (2002). Exploring foundations for computer-supported collaborative learning. In G. Stahl (Ed.), *Computer support for collaborative learning:*

Foundations for a CSCL community: Proceedings of the Computer-supported Collaborative Learning 2002 conference (pp. 72-81). Hillsdale, NJ: Erlbaum.

- Lipset, S. M., Trow, M. A., & Coleman, J. S. (2004). Union democracy: The internal politics of the International Typographical Union. In R. K. Yin (Ed.), *The case study anthology* (pp. 113-124). Thousand Oaks, CA: Sage
- Luppicini, R. (2007). Review of computer mediated communication research for education. *Instructional Science*, 35, 141-185. Retrieved October 23, 2008, from the SpringerLink database.
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370-396. Retrieved November 13, 2009, from the PsycARTICLES database.
- Mason, R. (1994). *Using communications media in open and flexible learning*. London: Kogan Page.
- Maxwell, J. A. (2005). *Qualitative research design: An interactive approach* (2nd ed.). Thousand Oaks, CA: Sage.
- May, T. (2001). *Social research: Issues, methods and process* (3rd ed.). Buckingham, England: Open University Press.
- McLoughlin, C., & Luca, J. (1999). *Lonely outpourings or reasoned dialogue? An analysis of text-based conferencing as a tool to support learning*. Paper presented at the annual conference of the Australasian Society for Computers in Learning in Tertiary Education, Brisbane, QLD, Australia.
- Mejias, U. (2004). Online discourse: Past, present and future. Retrieved February 17, 2009, from http://eduforge.org/docman/view.php/29/109/mejias_online_discourse_pdf
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
- Merriam, S. B. (2002). *Qualitative research in practice: Examples for discussion and analysis*. San Francisco: Jossey-Bass.
- Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco: Jossey-Bass.
- Merrill, H. S., DiSivestro, F., & Young, R. C. (2003). Assessing & improving online learning using data from practice. In *Midwest research to practice conference in adult continuing and community education. 8-10 October 2003* (pp. 142-147). Columbus, OH: Ohio State University.
- Meyer, J. H. F., & Muller, M. W. (1990). Evaluating the quality of student learning. I - An unfolding analysis of the association between perceptions of learning context and approaches to studying at an individual level. *Studies in Higher*

- Education*, 15(2), 131-154. Retrieved December 14, 2007, from the IngentaConnect database.
- Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco: Jossey-Bass.
- Mezirow, J. (2000). Learning to think like an adult. In J. Mezirow & Associates (Eds.), *Learning as transformation: Critical perspectives on a theory in progress* (pp. 3-34). San Francisco: Jossey-Bass.
- Mezirow, J. (2003). Transformative learning as discourse. *Journal of Transformative Education*, 1(1). Retrieved August 21, 2008, from <http://jtd.sagepub.com.ezproxy.library.uq.edu.au/cgi/reprint/1/1/58>
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage.
- Moore, M. G. (1972). Learner autonomy: The second dimension of independent learning. *Convergence*, 5(2). Retrieved November 30, 2009, from http://www.ajde.com/Documents/learner_autonomy.pdf
- Moore, M. G. (1973). Towards a theory of independent learning and teaching. *Journal of Higher Education*, 44, 661-679. Retrieved November 30, 2009, from the ProQuest Central database.
- Moore, M. G. (1989). Editorial: Three types of interaction. *The American Journal of Distance Education*, 3(2), 1-6.
- Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical principles of distance education* (pp. 22-38). London: Routledge.
- Moore, M. G. (1994). Editorial: Autonomy and interdependence. *The American Journal of Distance Education*, 3(2), 1-5.
- Moore, M. G. (2007). The theory of transactional distance. In M. G. Moore (Ed.), *The handbook of distance education* (2nd ed., pp. 89-101). Mahwah, NJ: Erlbaum.
- Morrow, S. L., & Smith, M. L. (1995). Constructions of survival and coping by women who have survived childhood sexual abuse. *Journal of Counselling Psychology*, 42, 24-33.
- Moyle, K., & Owen, S. (2008). Students' expectations about learning with technologies: A literature review. Retrieved January 18, 2010, from http://www.aictec.edu.au/aictec/webdav/site/standardssite/shared/Student_Voice_Literature_Review.pdf
- Nutbeam, D., & Harris, E. (2004). *Theory in a nutshell: A practical guide to health promotion theories* (2nd ed.). Sydney, NSW, Australia: McGraw-Hill.

- Oliver, R., & Herrington, J. (2003). Exploring technology-mediated learning from a pedagogical perspective. *Journal of Interactive Learning Environments*, *11*(2), 111-126.
- Palinesar, A. S. (1998). Social constructivist perspectives on teaching and learning. *Annual Review of Psychology*, *49*, 345-375.
- Palloff, R. M., & Pratt, K. (1999). *Building learning communities in cyberspace: Effective strategies for the online classroom*. San Francisco: Jossey-Bass.
- Palloff, R. M., & Pratt, K. (2005a). *Collaborating online: Learning together in community*. San Francisco: Jossey-Bass.
- Palloff, R. M., & Pratt, K. (2005b). *Online learning communities revisited*. Paper presented at the 21st annual conference on distance teaching and learning. Retrieved March 9, 2009, from http://www.uwex.edu/disted/conference/Resource_library/proceedings/05_1801.pdf
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Peräkylä, A. (2004). Reliability and validity in research based on naturally occurring social interaction. In D. Silverman (Ed.), *Qualitative research: Theory, method and practice* (2nd ed., pp. 283-304). Thousand Oaks, CA: Sage.
- Peters, O. (1967). Distance education and industrial production: A comparative interpretation in outline. Retrieved December 3, 2009, from <http://www.fernuni-hagen.de/ZIFF/PETERS.HTM>
- Peters, O. (1994). Distance education and industrial production: A comparative interpretation in outline (1973). In D. Keegan (Ed.), *Otto Peters on distance education: The industrialization of teaching and learning*. London: Routledge.
- Peters, O. (2003). Learning with new media in distance education. In M. G. Moore & W. G. Anderson (Eds.), *The handbook of distance education* (2nd ed., pp. 57-67). Mahwah, NJ: Erlbaum.
- Peters, O. (2007). The most industrialized forms of education. In M. G. Moore (Ed.), *The handbook of distance education* (2nd ed., pp. 57-67). Mahwah, NJ: Erlbaum.
- Piantanida, M., Tananis, C. A., & Grubs, R. E. (2004). Generating grounded theory of/for educational practice: The journey of three epistemorphs. *International Journal of Qualitative Studies in Education*, *17*(3), 325-346.
- Popper, K. R., & Eccles, J. C. (1977). *The self and its brain*. New York: Springer.

- Ragin, C. C. (1992). Introduction: Cases of "What is a case?". In C. C. Ragin & H. S. Becker (Eds.), *What is a case? Exploring the foundations of social enquiry* (pp. 1-17). England: Cambridge University Press.
- Richards, L. (2005). *Handling qualitative data*. London: Sage.
- Richardson, J. C. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *Journal of Asynchronous Learning Networks*, 7(1). Retrieved February 1, 2004, from <http://www.sloan-c.org/publications/jaln>
- Roberts, L. D., Smith, L. M., & Pollock, C. M. (2006). Communicating in synchronous text-based virtual communities: Internet relay chat. In S. Dasgupta (Ed.), *Encyclopedia of virtual communities and technologies* (pp. 42-48). Hershey, PA: Idea Group.
- Robson, C. (2002). *Real world research: A resource for social scientists and practitioner-researchers*. Oxford, England: Blackwell.
- Rossi, D. (2008a). Online learning communities: Adopting a learner centred perspective to frame lifelong learning futures. In D. Orr, P. A. Danaher, G. Danaher & R. E. B. Harreveld (Eds.), *Lifelong learning: Reflecting on successes and framing futures. Keynote and refereed papers from the 5th International Lifelong Learning Conference* (pp. 333-337). Rockhampton, Australia: Central Queensland University.
- Rossi, D. (2008b). Reflecting on research practice: A retrospective means of framing future learning. In D. Orr, P. A. Danaher, G. Danaher & R. E. B. Harreveld (Eds.), *Lifelong learning: Reflecting on successes and framing futures. Keynote and refereed papers from the 5th International Lifelong Learning Conference* (pp. 338-341). Rockhampton, Australia: Central Queensland University.
- Rossi, D. (2009). Relationships with peers enable 1st year students to negotiate and surmount social and educational challenges within virtual learning communities. *Studies in Learning, Evaluation, Innovation and Development*, 6(1), 98-111.
- Rossi, D., & Hinton, L. (2005). Reflections on practice: Course development & online teaching. *Studies in Learning, Evaluation, Innovation and Development*, 2(2), 9-19.
- Rossi, D., & Singh, G. (2007). Investigating knowledge construction in organisational and educational contexts: A social constructivist perspective. In R. Chapman (Ed.), *Managing our intellectual and social capital: Proceedings of the 21st ANZAM Conference* (pp. 1-14). Canning Bridge, Western Australia: Promaco Conventions Pty Ltd.
- Rourke, L., & Anderson, T. (2002). Using peer teams to lead online discussions. *Journal of Interactive Media in Education*, 1. Retrieved October 14, 2009, from <http://www-jime.open.ac.uk/2002/1/rourke-anderson-02-1.pdf>

- Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (1999). Assessing social presence in asynchronous text-based computer conferencing. *Journal of Distance Education*, 14(2), 50-71. Retrieved July 15, 2004, from the EBSCOhost database.
- Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (2000). Methodological issues in the content analysis of computer conference transcripts. *International Journal for Artificial Intelligence in Education*, 12(1), 8-22.
- Rovai, A. P. (2002). Building sense of community at a distance. *International Review of Research in Open and Distance Learning*, 3(1). Retrieved January 10, 2008, from <http://www.irrodl.org/index.php/irrodl/article/view/79/153>).
- Saba, F. (2000). Research in distance education: A status report. *International Review of Research in Open and Distance Learning*, 1(1), 1-9. Retrieved December 13, 2008, from the Directory of Open Access Journals database.
- Saldana, J. (2009). *The coding manual for qualitative researchers*. Thousand Oaks, CA: Sage.
- Salmon, G. (2002). Mirror, mirror, on my screen...Exploring online reflections. *British Journal of Educational Technology*, 33(4), 379-391.
- Salomon, G. (1993a). Editor's introduction. In G. Salomon (Ed.), *Distributed cognitions* (pp. xi-xxi). England: Cambridge University Press.
- Salomon, G. (1993b). No distribution without individuals' cognition. In G. Salomon (Ed.), *Distributed cognitions* (pp. 111-138). England: Cambridge University Press.
- Schrire, S. (2002). *The learning process, moderation and discourse patterns in asynchronous computer conferencing*. Unpublished doctoral dissertation, Nova Southeastern University, FL.
- Schrire, S. (2006). Knowledge building in asynchronous discussion groups: Going beyond quantitative analysis. *Computers & Education*, 46(1), 49-70. Retrieved December 12, 2007, from the ScienceDirect database.
- Schwandt, T. A. (1994). Constructivist, interpretivist approaches to human enquiry. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 118-137). Thousand Oaks, CA: Sage.
- Schwandt, T. A. (2000). Three epistemological stances for qualitative enquiry: Interpretivism, hermeneutics and social constructionism. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 189-213). Thousand Oaks, CA: Sage.
- Scott, J. (2000). *Social network analysis: A handbook* (2nd ed.). Thousand Oaks, CA: Sage.

- Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, 2(1). Retrieved December 11, 2008, from http://www.itdl.org/Journal/Jan_05/article01.htm
- Silverman, D. (2002). *Doing qualitative research: A practical handbook*. Thousand Oaks, CA: Sage.
- Simon, M. (1995). Reconstructing mathematics pedagogy from a constructivist perspective. *Journal for Research in Mathematics Education*, 26(2), 114-145.
- Simonson, M. (2003). A definition of the field. *Quarterly Review of Distance Education*, 4(1), vii-viii.
- Sims, R. (1999). Interactivity on stage: Strategies for learner-designer communication. *Australian Journal of Educational Technology*, 15(3), 257-272.
- Smith, R. O. (2008). Adult learning and the emotional self in virtual online contexts. *New Directions for Adult and Continuing Education* (120), 35-43. Retrieved April 5, 2010, from the EBSCOhost database.
- Solomon, P., Salvatori, P., & Guenter, D. (2003). An interprofessional problem-based learning course on rehabilitation issues in HIV. *Medical Teacher*, 25(4), 408-413. Retrieved January 8, 2010, from the EBSCOhost database.
- Sonn, C. C., Bishop, B. J., & Drew, N. M. (1999). Sense of community: Issues and considerations from a cross-cultural perspective. *Community, Work & Family*, 2(2), 205-218.
- Stahl, G. (2003). *Communication and learning in online collaboration. Paper presented at GROUP_03, Sannibel Island, FL. Retrieved November 23, 2009, from <http://www.cis.drexel.edu/faculty/gerry/publications/conferences/2003/group/group03.doc>.*
- Stahl, G. (2006). *Group cognition: Computer support for building collaborative knowledge*. Cambridge, MA: Massachusetts Institute of Technology Press.
- Stahl, G., & Hesse, F. (2006). Social practices of computer-supported collaborative learning. *Computer-Supported Collaborative Learning*, 1, 409-412.
- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.
- Stake, R. E. (2005). Qualitative case studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 443-466). Thousand Oaks, CA: Sage.

- Stetsenko, A., & Arievitch, I. (1997). Constructing and deconstructing the self: Comparing post-Vygotskian and discourse-based versions of social constructivism. *Mind, Culture and Activity*, 4(3), 159-172.
- Strauss, A. (1978). A Social World Perspective. *Studies in Symbolic Interaction*, 1(1), 119-128.
- Strauss, A., & Corbin, J. (1994). Grounded theory methodology: An overview. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 274-285). Thousand Oaks, CA: Sage.
- Strauss, A., & Corbin, J. (1997). *Grounded theory in practice*. Thousand Oaks, CA: Sage.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage.
- Strijbos, J.-W., Martens, R. L., & Jochems, W. M. G. (2004). Designing for interaction: Six steps to designing computer-supported group based learning. *Computers & Education*, 42, 403-424. Retrieved September 23, 2006, from the SpringerLink database.
- Sturman, A. (1997). Case study methods. In J. P. Keeves (Ed.), *Educational research methodology and measurement: An international handbook* (2nd ed., pp. 61-66). Oxford, England: Elsevier.
- Su, B., Bonk, C. J., Magjuka, R. J., Lui, X., & Lee, S. (2005). The importance of interaction in web-based education: A program-level case study of online MBA courses. *Journal of Interactive Online Learning*, 4(1). Retrieved February 20, 2008, from <http://www.ncolr.org/jiol/issues/PDF/4.1.1.pdf>
- Swan, K. (2002). Building learning communities in online courses: The importance of interaction. *Education, Communication and Information*, 2(1), 23-49.
- Swan, K., Shea, P., Fredericksen, E., Pickett, A., Pelz, W., & Maher, G. (2000). Building knowledge building communities: Consistency, contact and communication in the virtual classroom. *Journal of Educational Computing Research*, 23(4), 359-383.
- Taylor, E. W. (1997). Building upon the theoretical debate: A critical review of the empirical studies of Mezirow's transformative learning theory. *Adult Education Quarterly*, 48(1), 34-59.
- Taylor, E. W. (2000). Analysing research on transformative learning theory. In J. Mezirow & Associates (Eds.), *Learning as transformation: Critical perspectives on a theory in progress* (pp. 285-328). San Francisco: Jossey-Bass.
- Taylor, E. W. (2007). An update of transformative learning theory: A critical review of the empirical research (1999-2005). *International Journal of Lifelong*

Education, 26(2), 173-191. Retrieved January 29, 2009, from the Informaworld database.

- Taylor, J. C. (2001). Fifth generation distance education. In *Proceedings of the 20th International Conference of Data Engineering world congress: The future of learning - learning for the future: Shaping the transition*. Retrieved November 29, 2009, from http://www.fernuni-hagen.de/ICDE/D-2001/final/keynote_speeches/wednesday/taylor_keynote.pdf
- Tillema, H., & van der Westhuizen, G. J. (2006). Knowledge construction in collaborative enquiry among teachers. *Teachers and Teaching: Theory and Practice*, 12(1), 51-67. Retrieved October 9, 2009, from the Informaworld database.
- van Boxtel, C. (2000). *Collaborative concept learning: Collaborative learning tasks, student interaction and the learning of physics concepts*. Unpublished doctoral dissertation, Utrecht University, Netherlands.
- Veerman, A., & Veldhuis-Diermanse, A. E. (2001). Collaborative learning through computer-mediated communication in academic education. In *Euro CSCL 2001* (pp. 625-632). Maastricht, Netherlands: McLuhan Institute, University of Maastricht.
- Veldhuis-Diermanse, A. E. (2002). *CSC Learning? Participation, learning activities and knowledge construction in computer-supported collaborative learning in higher education*. Unpublished doctoral dissertation, Wageningen University, Netherlands retrieved July 8 2004 from <http://www.gcw.nl/dissertations/3187/dis3187.pdf>.
- von Glaserfeld, E. (1995). A constructivist approach to teaching. In L. P. Steffe & J. Gale (Eds.), *Constructivism in education* (pp. 3-16). Hillsdale, NJ: Erlbaum.
- von Glaserfeld, E. (2005). Introduction: Aspects of constructivism. In *Constructivism: Theory, perspectives and practice* (2nd ed., pp. 3-7). New York: Teachers College Press.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Vygotsky, L. S. (1981). The genesis of higher mental functions. In J. V. Wertsch (Ed.), *The concept of activity in Soviet psychology*. New York: Sharpe.
- Vygotsky, L. S. (1986). Thinking and speech (N. Minick, Trans.). In R. W. Rieber & A. S. Carton (Eds.), *The collected works of L. S. Vygotsky* (Vol. 1 Problems of general psychology, pp. 39-285). New York: Plenum Press.
- Vygotsky, L. S. (1987). Methods of studying higher mental functions (N. Minick, Trans.). In R. W. Rieber & A. S. Carton (Eds.), *The collected works of L. S. Vygotsky* (Vol. 6 Scientific legacy, pp. 57-68). New York: Plenum Press.

- Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications*. England: Cambridge University Press.
- Wedemeyer, C. A. (1971). Independent study. In L. C. Deighton (Ed.), *Encyclopedia of education* (Vol. 4, pp. 548-557). New York: Macmillan & The Free Press.
- Wedemeyer, C. A. (1975). *Implications of open learning for independent study*. Paper presented at the 10th International Council for Correspondence Education conference, Brighton, England. Retrieved December 2, 2009, from the ERIC database,
- Weller, M. (2007). The distance from isolation: Why communities are the logical conclusion in e-learning. *Computers & Education, 49*(2), 148-159.
- Wellman, B. (1999). The network community: An introduction to networks in the global village. In B. Wellman (Ed.), *Networks in the global village* (pp. 1-48). Boulder, CO: Westview Press.
- Wellman, B., & Gulia, M. (1999). Net-surfers don't ride alone: Virtual communities as communities. In B. Wellman (Ed.), *Networks in the global village* (pp. 331-366). Boulder, CO: Westview Press.
- Wells, G. (1999). *Dialogic inquiry: Towards a sociocultural practice and theory of education*. England: Cambridge University Press.
- Wenger, E. C. (1998). Communities of practice: Learning as a social system. *Systems Thinker, 9*(5). Retrieved February 11, 2009, from the Pegasus Communications database.
- Wertsch, J. V. (1985). *Vygotsky and the social formation of mind*. Cambridge, MA: Harvard University Press.
- Wertsch, J. V. (1991). *Voices of the mind: A socio-cultural approach to mediated action*. Cambridge, MA: Harvard University Press.
- Wertsch, J. V. (1994). Mediated action in sociocultural studies. *Mind Culture and Activity, 1*, 202-208.
- Wertsch, J. V. (1995). The need for action in sociocultural research. In J. V. Wertsch, P. Del Rio & A. Alvarez (Eds.), *Sociocultural studies of mind* (pp. 56-74). England: Cambridge University Press.
- Wertsch, J. V., Del Rio, P., & Alvarez, A. (1995). Sociocultural studies: History, action and mediation. In J. V. Wertsch, P. Del Rio & A. Alvarez (Eds.), *Sociocultural studies of mind* (pp. 1-34). England: Cambridge University Press.
- Wiesenfeld, E. (1996). The concept of "we": A community social psychology myth? *Journal of Community Psychology, 24*(4), 337-346. Retrieved December 28, 2007, from the InterScience database.

- Wise, L., & Quealy, J. (2006). At the limits of social constructivism: Moving beyond LMS to re-integrate scholarship. In L. Markauskaite, P. Goodyear & P. Reinmann (Eds.), *Proceedings of the 23rd annual Australasian Society for Computers in Learning in Tertiary Education conference: Who's learning? Whose technology?* (pp. 899-907). NSW, Australia: University of Sydney.
- Witz, K. G. (2007). "Awakening to" an aspect in the other: On developing insights and concepts in qualitative research. *Qualitative Inquiry*, 13(2), 235-258.
- Woo, Y., Herrington, J., Agostinho, S., & Reeves, T. C. (2007). Implementing authentic tasks in web-based learning environments. *Educause Quarterly*, 30(3). Retrieved September 11, 2009, from the Directory of Open Access Journals database.
- Wood, J. T. (2004). *Interpersonal communication: Everyday encounters* (4th ed.). Belmont, CA: Wadsworth.
- Yin, R. K. (1994). *Case study research* (2nd ed.). Thousand Oaks, CA: Sage.
- Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Zhu, E. (2006). Interaction and cognitive engagement: An analysis of four asynchronous online discussions. *Instructional Science*, 34, 441-480.
- Zinchenko, V. P. (1985). Vygotsky and units for the analysis of mind. In J. V. Wertsch (Ed.), *Culture, communication and cognition: Vygotskian perspectives* (pp. 94-118). England: Cambridge University Press.

Appendix A: Extract from the file uploaded to the InFlow software program

Large group discussion week 6			
From_name	To_name	Strength	Network
Morgan	Topical Issue	4	6
Jenny	Morgan	1	6
Emily	Questions	1	6
Yasmin	Emily	1	6
Fiona	Topical Issue	4	6
Jenny	Fiona	1	6
Fiona	Jenny	1	6
Jenny	Fiona	1	6
Jane	Fiona	2	6
Jenny	Jane	1	6
Jane	Jenny	1	6
Nari	Jenny	1	6
Course Coordiator	Jenny	5	6
Course Coordiator	Fiona	5	6
Fiona	CC	2	6
Yasmin	Fiona	1	6
Yasmin	Nari	2	6
Nari	Fiona	1	6
Morgan	Nari	1	6
Emily	Morgan	1	6
Ruth	Fiona	1	6
Ruth	Jenny	2	6
Ruth	Questions	1	6
Belinda	Ruth	1	6
Emily	Ruth	1	6
Emily	Belinda	1	6
Ruth	Emily	1	6
Jenny	Ruth	2	6
Fiona	Ruth	1	6
Jane	Fiona	2	6
Rena	Topical Issue	4	6
Rena	Simon	2	6
Nari	SG Individual	1	6
Nari	SG Individual	1	6
Nari	SG Individual	1	6
Jane	Questions	1	6
Alaine	Jane	1	6
Jane	Alaine	1	6
Jenny	Jane	1	6
Jenny	Topical Issue	4	6

Appendix B: Example of initial coding and an associated procedural memo

Initial coding – Free nodes

Agree
Anticipated application
Attachment use
Clarifying
Community
Confusion
Debating
Disagree
Electronic text & symbols
Explicit reference to resources
External information and experience
Implicit reference to resources
Interaction
Knowledge construction
Learner traits
Multiple messages
Non-verbal
Overwhelmed
Learner-learner support
Planning for collaboration
Procedural guidance
Questioning
Referencing guidance
Reflecting
Roles
Seeking advice
Self awareness
Self-disclosure
Social presence
Teacher presence
Technical difficulties/frustration
Technical solution
Theory and example

Procedural Memo: No date

The list of nodes is quite long and becoming difficult to manage and scroll through when coding. Also some nodes appear associated and or linked to others so all nodes converted to tree nodes with varying levels of hierarchy. Experienced some difficulty merging and re-arranging nodes. Reviewed all coded sections and references for week 2 at least 3 times. Believe that for the most part the issues related to merging have been resolved. There are some issues as content can be coding in a number of different ways - that is sentences can be coded in more than one way - this is an issue that will need to be addressed - as it is likely to impact upon the trustworthiness of the coding?

Appendix C: Examples of focused coding and associated procedural memos

Focused coding – Tree nodes

- Access & motivation
 - Difficulties or concerns
 - Online learning
- Information exchange
 - Communication style or strategies
 - Poor spelling or grammar
- Online learning community
 - Mediated interaction
 - Anonymity participation & voice
 - Misunderstandings & frustrations
 - Time commitment management motivation
 - Trust deceit & the lack of non-verbal comm..
 - Online socialisation
 - Asking for feedback (general)
 - Chatting or social talks
 - Complimenting or expressing appreciation
 - Conventional expressions of emotion
 - Defensiveness
 - Self-disclosure
 - Unconventional expressions (emotion or other)
 - Use of humour
- Constructing knowledge
 - Acknowledgement or appreciation for diversity
 - Asks for clarification or a content related question
 - Compares or contrasts concepts examples or content
 - Compliments or appreciates peer contributions
 - Evaluates or draws conclusions from concepts examples
 - Explicit link between theory and general example
 - Explicit link between theory and multiple examples
 - Explicit link between theory and personal example
 - Identifies shared field of knowledge or experience
 - Implicit link between theory and general example
 - Implicit link between theory and multiple examples
 - Implicit link between theory and personal example
 - Indicates lack of knowledge ability skill or understanding
 - Provides clarification explanation or procedural advice
 - Provides examples or opinions without theoretical rationale
 - Repeats information or reference to peer post no interpretation
 - Supported agreement or disagreement
 - Unsupported agreement or disagreement
- Knowledge development
 - Changes in perspective or behaviour
 - Generalisation hypothesis or proposed application
 - Increase in conceptual understanding
 - Increase in self knowledge
 - Integration or synthesis of content from external source
 - Integration or synthesis of content from internal source
 - Intuitive understanding or peer sensitivity
 - Supplements or extends contributions from self or others
- Intrasubjectivity or metacognition
 - Learning
 - Planning
 - Self
 - Task

Procedural memos: Tree Nodes

Started coding data from week 6, continuing to add and or rename nodes depending upon the content of posts within the discussion board. The list of tree nodes is now very long and complicated which makes it again difficult to manage. There also appears to be a degree of repetition as some child nodes appear linked to more than one parent node. This problem prompted me to think about ways of visualising initial thoughts about nodes, the connections between nodes and connections between nodes and the conceptual framework. I now have several handdrawn models which have been revised several times.

5/10/2007 5:24 PM

I haven't completed coding for week 6 (about 45 out of 120 to code) but finding that the current tree structure and node headings seem less appropriate than before the list continues to grow and I am of the view I will need to go back and restructure ...it seems sensible to do that now ... I will do a node and code report prior to the restructure and link to the audit trail memo to maintain a record of structural change.

24/10/07

Following on from previous discussion I reviewed and merged codes and data using the revised scheme. However some of the posts are complex and at times convoluted and many messages can still be coded by more than one code...

Points of interest

I have found coding more complex than I anticipated, partly because of multiple examples, expansions and interactive weaves of posts and responses. I can also see now how easy it may be to get lost in the data! There are so many interesting things happening – so many potential paths to follow - its hard to keep track – funnily enough this is a repeated concern of the learners. I had some concerns about what I might do with the data once I had coded the selected discussions and while I am still not too sure there are a number of interesting things that have come to light following coding.

In week 6 the topic which was selected/negotiated by learners was: How can effective listening and ineffective listening impact on personal and professional relationships? Regardless of subject headers there appear to be a series of themes, or foci of discussion – the following examples specifically spring to mind; the merits of a dual perspective, acknowledgement of poor listening skills by learners (lots of self reflection, acknowledgement of strengths and weaknesses and self monitoring in relation to personal communication skills), the importance of listening to children and communication differences associated with gender.

Then of course there are discernable and recurrent processes associated with interactions and knowledge construction. Until now I wasn't aware of the extent to which brackets were used by learners to provide background information, or place a conversation in context – so the inclusion and use of brackets appears to read like a subtext (or an aside) which clarifies or provides additional information contextualizing the interaction. Humour is used frequently - often in ways that appear to remove the sting or barb of a comment, to avoid potential offence or to cover up/detract from an admission of some sort.

Focused coding –Tree Nodes (subsequent)

Mediated interaction

- Anonymity participation & voice
- Communication style or strategies
 - Attachments
 - Bracketing
 - Splitting posts
 - Use of humour
- Non-verbal communication

Mediated relationships

- Belonging acceptance & support
- Expressions of emotion
- Self-disclosure
- Trust deceit & the lack of non-verbals

Knowledge construction - reconstruction

- Making sense of
 - Asks for clarification or a content related question
 - Compares or contrasts concepts and or examples
 - Provides clarification and or explanation
 - Values or appreciates peer contribution
 - My understanding
 - Explicit link between theory and example (supported)
 - Explicit link between theory and example (not supported)
 - Implicit link between theory and example (supported)
 - Implicit link between theory and example (not supported)
 - Acknowledges lack of knowledge ability skill
 - Provides examples or opinions without reference to theory
 - Our understanding
 - Identifies shared field of knowledge or experience
 - Supported or unsupported agreement
 - Your understanding
 - Supported or unsupported disagreement
- ### Knowledge development
- Changes in perspective behaviour or understanding
 - Evaluates or draws conclusions from concepts
 - Generalisation hypothesis or proposed application
 - Supplements or extends contributions
 - Synthesis of content from course resources
 - Synthesis of content from external sources

Appendix D: Assessment criteria for individual and group activities

Assessment Criteria	Criteria Description	Allocation of marks
<p>Individual activities: Completion & submission of weekly activities as requested</p>	<p>The maximum award for individual submission of individual and group activities is 2 marks. Thus, no more than 2 marks will be awarded if a student chooses to submit an individual response to group activities.</p>	<p>1 Mark Descriptive response to individual activities</p> <p>2 Marks Analytical response to individual activities</p>
<p>Group activities: Participation in group discussion, completion & submission of group activities as requested</p>	<p>Participants in group discussions must be clearly identifiable. Identification can be through use of the participants name or by participant use of colored text Participants in group discussions will be awarded a maximum of 2 marks. Non-participants or non-identifiable participants will receive no marks.</p>	<p>1 Mark Participants provide a descriptive response to group activities. They make no reference to or comment about the contributions of other group members in relation to group activities</p> <p>2 Marks Participants provide an analytical response to group activities. They make reference to and comment upon the contribution of others in relation to group activities. Please note: Students may comment positively or constructively indicating their agreement or disagreement with another student's contribution but must always provide a reason or an example to support their position. In this way participants may be exposed to a range of different ideas which may subsequently enhance their learning and influence their perception on the topic under discussion</p>
<p>Content & depth of group discussion: Demonstration of ability to analyze, synthesize and or apply theory to real world situations.</p>	<p>The allocation of the remaining 6 marks will be dependent upon the nature of the weekly activities i.e. whether they are individual & or group and the content of the response. E.g. a descriptive response will receive 2 marks, analytical response 4 marks, demonstration of the ability to synthesis and apply theory to real world 6 marks.</p>	<p>2 Marks The group summary clearly identifies participants in the discussion and gives a detailed account of different aspects of a topic</p> <p>4 Marks The group summary clearly identifies participants in the discussion and examines components and the relationship between components. Group discussion is evidenced by the notation or inclusion of student comments about the contribution of others in relation to group activity.</p> <p>6 Marks The group summary clearly identifies participants in the discussion and examines components and the relationship between components. Group discussion will be evidenced by the notation or inclusion of student comments in relation to group activity. In addition there may be reference to theory, resources or materials which demonstrates the ability of the group to analyse synthesise and or apply theory to various real world situations</p>

Appendix E: Contribution from Jenny LGDW6

EFFECTIVE LISTENING AND INEFFECTIVE LISTENING IN PERSONAL AND PROFESSIONAL RELATIONSHIPS

Listening when spoken to is a courtesy which shows respect to the speaker. To achieve this, the listener needs to listen actively. Active listening incorporates all the skills of listening some of them being recognition of and use of nonverbal language e.g. nodding, smiling and eye contact, engage in discussion based on the speakers perspectives and not your own. Any barriers in the way of communication between people, these can be external such as noise or internal such as prejudgment of others, can disrupt the flow of meaning and lead to inappropriate emotional responses.

The International Listening association (1995), emphasises that listening is an active process which means we have to exert effort to listen well. We have to be involved with our ears, hearts and minds.

A personal example of my lack of listening effectively occurred last weekend. My husband came to the patio where I was studiously reading chap. 6 and 7 of this weeks notes and only had about 3 pages to go. He asked if anyone wanted to go for a walk. I know I glanced at him and thought to myself quickly it would be lovely for a walk but neglected to say the words as I was primarily engrossed in my work.

I was being affected by the internal obstacle of preoccupation, my reading causing me to not listen actively. I was practising selective listening due to the family noise around me and only responded if I was addressed using my name. I wasn't being mindful of my husbands desire to organise a family outing and respectfully reply. I focused on the information and not on him causing my husband to feel disconfirmed. I didn't listen with my heart. My listening was ineffective. Active and mindful listening is hard work and I should have stopped what I was doing, given him my full attention and engaged in verbal dialogue. When I read this back to my husband he said you mean I was cranky because you ignored me and that about summed it up.

In a professional sense listening ensures the correct message is received therefore giving maximum benefit to the process required to complete tasks. We should engage in a dual perspective approach to interpret and understand the message without disrupting the communicators meaning with our own thoughts. Robert Bolton (1986,p167) says that good listeners 'stay out of the others way' so they can learn what others feel.

Managers who listen mindfully and actively to subordinates will receive respect and compliancy in return and the employee will feel respected and valued for their investment in their job. Subordinates who listen will feel confident in their abilities and earn respect of the manager who will reward with praise and autonomy. Poor listening is the reason some people don't advance in careers. (Deal & Kennedy, 1999; Waner, 1995).

Different types of listening is required for different situations and responses are shaped by the perception of the message. I believe this is why we need to fully focus our attention to ensure we understand the correct message and show respect.

REFERENCES

Robert Bolton (1986,p167).
Deal & Kennedy,(1999);Waner,(1995).
The International Listening Association, (1995).

BIBLIOGRAPHY

WOOD,J.T. Interpersonal Communication Everyday Encounters (2nd ed.) Thompson Wadsworth Learning