

**The impact of text-based computer-mediated communication (CMC) on
teachers' professional learning (TPL)**

Caroline Daly

Institute of Education, University of London

Thesis submitted in partial fulfilment of the requirements for the degree of
Doctor of Philosophy (Ph.D.) of the University of London

2008



The work submitted in this thesis is solely that of Caroline Daly.

Caroline Daly

Thesis word count (exclusive of appendices and bibliography): 99, 959

ABSTRACT

The thesis investigates the impact of text-based computer-mediated communication (CMC) on teachers' professional learning (TPL). It is based on the online discussions conducted by a group of teachers participating in an accredited course in continuing professional development. Concepts of 'community' and 'agency' are identified as core conceptual links between the fields of CMC and TPL. These concepts inform theoretical perspectives on the impact of CMC, based on socio-constructivist perspectives on learning, and inform an analysis of TPL.

A qualitative case approach is adopted, in which CMC is conceived of as a social and literate practice, and TPL as a complex social, as well as individual, phenomenon. As a tutor-researcher, my role in creating a narrative of the case, and contributing to its interpretation, is made explicit. To investigate in an underdeveloped field, interdisciplinary methods are developed, which are: a sociometric analysis of the discussions to examine the 'relatedness' of the online texts; the adaptation of a Qualitative Content Analysis model (Garrison and Anderson, 2003) to conduct detailed textual analysis of the discussions; and narrative interviews with the teachers to investigate their perspectives on their learning and participation in the discussions. The findings indicate that the teachers' learning contains features of community and agency, but does so inconsistently, and displays varying degrees of the effects of hegemony on agentive conceptual development.

The thesis proposes that TPL within CMC is constituted by three sets of relations: peer relations, textual relations and relations of reification, by which teachers develop a process-oriented engagement with their learning. This engagement develops differently among individuals, and they occupy different positions within these relations which affects how far the learning can be identified with concepts of 'community', and how far it can be identified as 'agentive'.

TABLE OF CONTENTS

Chapter 1: Introduction	11	
1.1	The development of the research focus	11
1.2	CMC and learning – revolution or evolution?	13
1.3	Teacher learning and e-learning	15
1.4	My relationship with the case	17
1.5	Individual and social perspectives on learning with text-based CMC	18
1.6	Outline	20
Chapter 2: Theoretical Perspectives	24	
2.1	Introduction	24
2.2	CMC as a socio-constructivist learning practice	26
2.2.1	The claims made for CMC as a constructivist learning practice	26
2.2.2	CMC as a literate practice	29
2.2.3	Language and knowledge construction	30
2.2.3.1	Vygotskian perspectives	30
2.2.3.2	Mercer's adaptation of Vygotskian theory to education contexts	31
2.2.4	Writing and learning	33
2.2.4.1	Writing as a cognitive tool	33
2.2.4.2	Writing as intellectual amplification in CMC	35
2.2.5	Summary	37
2.3	Teachers' professional learning (TPL)	38
2.3.1	Contemporary contexts for TPL	39
2.3.2	Concepts of community in TPL	41
2.3.2.1	Theoretical perspectives on teachers' learning communities	41
2.3.2.2	Obstacles to community perspectives on TPL	42
2.3.2.3	Wenger's theory of Communities of Practice	44
2.3.2.4	Purpose and learning in a COP	47
2.3.2.5	Concepts of community and critical thinking	49
2.3.2.6	Summary – the relevance of community for examining the impact of	53

	CMC on TPL	
2.3.3	Concepts of agency in TPL	54
2.3.3.1	The perceived need for agency	54
2.3.3.2	Meta-learning	57
2.3.3.2.1	Learning and CMC	58
2.3.3.3	Teacher narration	62
2.3.3.4	Reflexivity	67
2.3.3.5	Summary – the relevance of agency for examining the impact of CMC on TPL	72
2.4	Summary of Chapter 2	73
	Chapter 3: Methodology	75
3.1	Introduction	75
3.2	The case approach	76
3.2.1	The research stance	80
3.2.2	Ethics	82
3.2.3	The sample of case study participants	83
3.3	Mapping the online texts	84
3.3.1	Sociometric theory	85
3.3.2	Graph theory	86
3.3.3	Developing a method for mapping texts	87
3.4	Interviews with the teachers	94
3.4.1	The interview sample	95
3.4.2	The pilot interview	97
3.5	Methodologies in CMC	100
3.5.1	A sceptical stance towards positivist approaches to textual analysis	100
3.5.2	An inductive approach to analysing online texts	102
3.5.3	Qualitative Content Analysis (QCA)	106
3.5.4	The Qualitative Content Analysis model	108
3.5.5	The unit of analysis	110
3.5.6	The pilot	113
3.5.7	Indicators	115

3.5.8	Manifest and latent variables	116
3.5.9	Working with manifest variables	120
3.5.10	Working with latent variables	121
3.5.11	Evaluating the pilot	124
3.5.12	The revised model for QCA of TPL in CMC	125
3.5.13	Developing the model	128
3.5.14	The derivation of the categories and their indicators	131
3.6	Conclusion	133
Chapter 4: Maps of the Online Discussions		136
4.1	Introduction	136
4.2	Analysing the maps	136
4.2.1	Constructing the maps as an interpretive process	140
4.2.2	The maps	144
4.2.3	Constructing the matrices	148
4.2.4	Analysis of ‘outdegree’ as a measure of participation	152
4.2.5	Paths	155
4.2.6	Neighbourhoods	158
4.2.7	Inclusiveness	160
4.2.8	Density	162
4.3	Analytical overview	163
4.4	Evaluation of using graph theory for developing the case	165
4.5	Summary	169
Chapter 5: Qualitative Content Analysis of the Online Discussions		173
5.1	Introduction	173
5.2	The data	174
5.2.1	The context	174
5.2.2	The tasks	175
5.3	Data collection	176
5.3.1	The transcripts	176

5.3.2	Data sample	177
5.4	Applying the QCA model	178
5.4.1	Overview	178
5.4.2	Stage one – coding for manifest variables	179
5.4.2.1	Identifying the categories	179
5.4.2.2	Identifying the indicators of the categories	182
5.4.2.2.1	Reflection on constructing the coding tables	187
5.4.2.3	Examples of stage one coding	191
5.4.2.4	Reflection on coding for manifest variables	195
5.4.3	Stage two – interpreting the manifest variables	196
5.4.3.1	Analysis of category: identity-building	198
5.4.3.2	Analysis of category: meta-level engagement	203
5.4.3.3	Analysis of category: teacher narration	206
5.4.3.4	Analysis of category: scaffolding	208
5.4.3.5	Analysis of category: argumentation	211
5.4.3.6	Analysis of category: community-building	214
5.4.4	Building a theory of TPL and CMC based on the manifest variables	216
5.4.4.1	Re-reading the manifest variables	216
5.4.4.2	A theory of TPL within CMC in the case context	221
5.4.5	Stage three – identifying the latent variables of TPL within CMC	229
5.5	Evaluation of methods	230
5.6	Summary	232

Chapter 6: Interviews with the teachers	234
--	------------

6.1	Introduction	234
6.2	The narrative approach	234
6.2.1	The dual role of narrative in interviews as experiential data	234
6.2.2	The interviews as narrative data	238
6.2.3	Narrative analysis	239
6.3	The data	242
6.3.1	Data collection	243
6.3.2	The interpretive process	243

6.4	Analysis	246
6.4.1	Peer relations	246
6.4.2	Textual relations	252
6.4.3	Relations of reification	257
6.5	Analysis and synthesis of the case	261
6.6	Conclusion	264
6.7	Summary	266
Chapter 7: Synthesis and Conclusion		267
7.1	Introduction	267
7.2	Synthesising the case	267
7.2.1	The case as a complex	267
7.2.2	The case as a view of reality	268
7.2.3	'I' as researcher and verification	271
7.3	A theoretical overview	273
7.3.1	Key issues from the analysis of community and agency in TPL and CMC	273
7.3.2	A model of TPL within an online COP	274
7.4	Conclusion	280
7.4.1	Learning as process	280
7.4.2	Summary of main findings	283
7.5	Directions for further research	285
7.6	Summary	288
REFERENCES		290
APPENDICES		
Appendix I:	Example of the units of analysis	309
Appendix II:	The interview schedule	313
Appendix III:	The pilot derivation of categories and indicators for qualitative content analysis	319

Appendix IV: Adjacency matrices for maps 2 and 3	324
Appendix V: Coding table for ‘meta-level engagement’ from transcript 3	326

TABLES

Table 1.1	The data sets	22
Table 3.1	The case sample Master of Teaching tutor group	83
Table 3.2	The interview sample	96
Table 3.3	Community of inquiry categories and indicators (Garrison and Anderson, 2003, p. 30)	109
Table 3.4	Elements of teachers’ professional learning (pilot)	114
Table 3.5	Pilot categories and indicators of TPL for the element ‘participation’	115
Table 3.6	Total messages in online discussion used for pilot	116
Table 3.7	Professional learning categories and example indicators, adapted from the QCA model for research into computer mediated communication (Garrison and Anderson, 2003)	116
Table 3.8	Indicators of the category ‘autobiography’	119
Table 3.9	Revised categories and indicators for a qualitative content analysis model for identifying TPL	128
Table 4.1	Adjacency matrix for map 1	150
Table 4.2	Outdegree in the three discussions	153
Table 4.3	The ‘indegree’ measure of the neighbourhoods in the three discussions	159
Table 4.4	Inclusiveness of the maps based on indegree	161
Table 4.5	Participants selected for interview	167
Table 5.1	The online discussion topics	175
Table 5.2	Distribution of messages sent in the three online discussions and the sample in relation to this	178
Table 5.3	Key for stage one coding	180
Table 5.4	The coding for categories of the first three messages from transcript 1	180
Table 5.5	Examples of indicators and manifest variables for each of the TPL categories	184
Table 5.6	Distribution of manifest variables for each category	190
Table 5.7	Analytical points derived from the manifest variables	217

FIGURES

Figure 3.1	Conventional sociogram based around a person, shaded	88
Figure 3.2	Example of mapping	91
Figure 3.3	Example of top row added to record the total responses made to texts by each participant	92
Figure 4.1	Map 1: MTeach tutor group online discussion 1	145
Figure 4.2	Map 2: MTeach tutor group online discussion 2	146
Figure 4.3	Map 3: MTeach tutor group online discussion 3	147
Figure 4.4	Paths (2) in map 1	156
Figure 4.5	Paths (14) in map 3	156
Figure 7.1	Teachers' professional learning within an online COP	275

CHAPTER 1: INTRODUCTION

1.1. The development of the research focus

This research aims to examine the impact of text-based, computer-mediated communication (CMC) on teachers' professional learning (TPL). It adopts a case approach, embedded in my work as a tutor and module leader on the mixed-mode Master of Teaching (MTeach) degree course at the Institute of Education, University of London, where I have been a member of the development team since the course was launched in September 2001.

Although the impact of new technologies on professional teacher learning is a research area which is as yet scarcely explored (Fisher et al., 2006), there has been an expansion in the development of online forums which aim to meet the development needs of other professionals "with common interests and complementary knowledge needs" (Fayard, and DeSanctis, 2005, n.p.) and in Higher Education (HE), there has been a considerable expansion in the adoption of CMC within mixed-mode and distance learning contexts. Rourke and Kanuka (2007) and Veerman et al. (2000) have pointed out that despite this, and at least two decades of investigation into online discussion in HE, there is little empirical evidence that engaging with online discussion leads to any significant increase in critical thinking for participants. This research is undertaken at a time of growing awareness in universities in the United Kingdom of the lack of knowledge about the learning experiences of 'e-learners', and about the contribution made by CMC towards learning goals within a reappraisal of the university as a place of learning in a new age of communications (Ramsden, 1998; Laurillard, 2002; Higher Education Funding Council for England, 2005).

In this case, teachers' professional learning is conceptualised as a transformation, or increase in the knowledge base which affects practice, and which has a future perspective. It involves the notion of the scholarship of teaching, derived from work undertaken by Boyer (1990) and Rice (1992) in the context of HE and subsequent developments in the field (Hutchings and Shulman, 1999). This suggests not only the development of a complex web of knowledge and understandings to inform changes in practice (Furlong, 2000), but also the development of critical and independent dispositions which are essentially agentive (Abbott, 1994; Watkins et al., 2002). The collaborative construction of knowledge about

teaching is core to this conceptualisation, by which professional learning involves shared notions of professional identity (Moore, 2004) and collegiality (Sachs, 2003b; Lingard et al. 2001). This conceptualisation underpins the aims and design of the MTeach as a course for teachers demanding, as it does, a high level of collaborative activity through online discussion as a main source of learning. It is this view of teachers' professional learning as involving knowledge construction through social interaction, which underpins the inquiry into the impact on it of CMC.

My tutor group of fifteen experienced teachers forms the basis for the case study of professional learning within a text-based online environment, which started when I tutored this group when they began the MTeach in September 2002. Stake (1995) has claimed that in qualitative case research, "there is no particular moment when data gathering begins" (p. 49) and that a query exists prior to any conception of carrying out a study. This emphasis on the query growing out of experience, tacit knowledge and 'first impressions' (*ibid.*) is apt to describe the early formulation of this case. It became apparent to me during the previous academic year, when I 'lurked' (with students' knowledge) in another tutor group forum in order to observe the online discussions before taking my own group, that the ideas which participants expressed online were affected by the fact that they were using an asynchronous electronic environment to communicate with each other in writing. A variety of linguistic and socio-communicative characteristics marked out their online writing as different from other forms of both written and spoken communication which are prevalent and authorised within the academy, in seminar discussion and written essays for example. At the same time, my reading of Warschauer (1999) which made claims for the 'intellectual amplification' made possible through asynchronous online discussion, and Lapadat (2000) on the constructivist properties of online writing, helped the formulation of questions about what I was observing within the online discussions. These questions concern the relationship between the ideas the participants developed and the process of writing online - what are the effects of online collaboration with peers on individual thinking, and what role is played by asynchronous exchange in this? Although these questions could have been developed for any group of online learners, my interest in teachers' professional learning is contextualised by the MTeach degree, which is itself based on a concept of teachers' learning as both critically informed and professionally situated. These questions have focused my thinking about asynchronous CMC as a social and literate practice, distinct

from other forms of CMC such as synchronous chat or video-conferencing, which involves participants in composing a constantly evolving electronic text characterised by time-lag, composed of multiple postings over time, in which participants' ideas intersect. This evolving intersection of ideas within ongoing written electronic exchange I have termed 'dynamic textuality' to describe what is key about the ontological possibilities of engaging in electronic discussion for teachers' learning.

Out of this multifaceted conception of CMC, the textual conditions of the asynchronous forum are investigated for their effects upon thinking, and in the case of teachers this is in the light of the practice-based experiences which they recount online. Out of these concerns came the formulation of the research question: '*What is the impact of text-based computer-mediated communication on teachers' professional learning?*' and the decision to research my own tutor group the following year within a case study approach, which enabled me to collect data over the two years minimum time required to complete the degree.

1.2 CMC and learning – revolution or evolution?

Whilst there is agreement that new technologies have brought fundamental changes in communicating to learn within a context of local and global societal change, such changes have been conceptualised from different theoretical perspectives. The case study is contextualised by contemporary perspectives on the degree and types of change which are brought about by learning with technologies. Harasim (2000) has argued that a 'paradigm shift' has been brought about by a 'knowledge revolution' (n.p.); Andriessen et al.'s (2003) evolutionary perspective claims that a new 'knowledge age' has replaced the first 'information age' in the contemporary history of learning and technologies; Lanham's (1993) early technocentric claim was that knowledge is being reconstituted in terms of ownership and power relations brought about by the electronic word, while Kress (2003) has focused on the potential learning revolution contained within the transformed semiotics of multimodal communication. Some have argued (Harasim, 2000; Laurillard, 2002; Lapadat, 2002; Garrison and Anderson, 2003) that the results offer the potential for *improvements* in learning, which Harasim (2000) claims to be the twin potentials of "the improved quality of learning" and "the improved opportunities to participate". Specific to the development of the case was Garrison and Anderson's argument that the key potential

for CMC to impact on learning lies in the “capacity to support reflective text-based interaction, independent of the pressures of time and the constraints of distance” (2003, p. 6). Through the development of a theoretical approach to the research this view has shifted to explore more fully what constitutes the “capacity to support reflective text-based interaction” with an increasing emphasis on the reflective dimension in the context of TPL. This has meant a focusing on the community and agentive aspects of CMC.

It is increasingly acknowledged that there is a need for greater understanding of the ways in which new technologies affect learning (JISC, 2005; Seale, 2003). Kress (2003) and Synder (2002) assert that the term ‘revolution’ is apt to indicate the far-reaching significance of economic, technological and social changes: Snyder insists that the impact of new technologies on learning and pedagogy is “more of a revolution than an evolution” (2002, p. 18) and argues for a fundamental shift in the way knowledge is organised and accessed. To date though, the theoretical claims for ‘revolution’ are not well supported by research into how CMC brings about conceptual change in participants. Talk of ‘revolution’ in the field of learning with technologies is contested – are the new learning contexts and conditions really so radical, given that the roots of constructivist theory lie in long-existing communicative contexts for learning? What is it about the collaborative learning conditions for constructing knowledge through writing online that could be so different? These issues are explored in the examination of the literature in Chapter 2. This research has adopted a cautious approach to claims of fundamentally altered learning processes brought about by CMC. It examines a transposition of text-based communication to the asynchronous domain where socio-constructivist theories argue that the technological effects of time lag and altered social relations bring about conceptual change in participants. The effects of this transposition are not yet well-explored in the literature, but the case has developed within a stance that is more sympathetic to Oliver’s (2003) argument for a ‘dynamic evolution’ in the field of learning with new technologies, rather than a ‘revolution’. ‘Evolution’ suggests changes in the practices of things with which we are already familiar, the incorporation of the new within existing frameworks, social and literate, of cultural reference and a shift in ways of understanding that are different from what has gone before but are inextricably linked to it.

1.3 Teacher learning and e-learning

Traditional concepts of knowledge as fixed, bound by cultural processes and institutions including printed books, university ascribed ‘subjects’, hierarchical education departments and school courses, are all challenged by the non-linear, non-hierarchical and collaborative formulations of knowledge available via electronic communication. CMC is embedded in ideas about the democratisation of knowledge and this has been a paradoxical context for this research into its impact on teacher learning.

The prefaces to two recent publications on teacher learning and e-learning seem to out-do each other in emphasising that these are propitious times in these distinct fields. Though both are bound up with notions of global change and altered understandings of knowledge, there is as yet no substantial work which has brought together these two fundamentally inter-related fields which share a future perspective, and which explores the potential of new technologies in the learning of teachers towards goals which have a revised sense of educational purpose in a world of inevitable change. Both advise that society is entering a phase of fundamental change, based on altered conditions for learning and being in the world:

After a decade of relentless reform in a climate of shaming and blaming teachers for perpetuating poor standards...Governments almost everywhere are beginning to speak more positively about teachers and teaching – bestowing honour and respect where blame and contempt had prevailed in the recent past. The time has rarely been more opportune or more pressing to think more deeply about what professional learning, professional knowledge and professional status should look like for the new generation of teachers who will shape the next three decades of public education. (Lingard et al., 2003, pp. vii - viii)

Various authors have described the growth of e-learning as explosive, unprecedented, amazing, and disruptive. In fact, there are those who argue that we are experiencing a revolution in higher education...Considering the ubiquity of e-learning, and the enormous opportunities and risks it presents for higher education, we need more than a fragmented approach to studying and understanding this phenomenon...Is e-learning to be used simply to enhance inherently deficient existing practices (e.g., lecturing)? Or does this technology have the potential to transform the educational transaction...(Garrison and Anderson, 2003, p.xi)

In these contexts it is impossible to engage in research into CMC and teacher learning without having an ethical orientation towards the *purposes* of technology in relation to the *purposes* of education. Snyder's analysis (2002) of the impact of new technologies on education is uncompromising here – within “the new communications order...the world for which schools were formed no longer exists” (pp. 173-179). If education is to be learning-centred within the new technological contexts, then the adaptation of CMC to teacher learning requires further understanding. What is distinctly lacking in the expansion of technologies in HE for teachers, is a review of what they have to offer as pedagogical tools in the domain of professional learning within a broader view of what the aims of teacher learning might be, and of the type of profession and education system that emerges.

Snyder's ‘new communications order’ is seen as offering the potential for intellectual independence, an agentive possibility within the impact of societal change upon individuals, which carries implications for the learning of teachers and their own roles within society. There is potential for new learning practices to play a part in countering the reductivist discourse of teaching and teacher education which has dominated for the past decade, and which has been assessed to have narrowed the purposes of Continuing Professional Development (CPD) (Wrigley, 2004) along with narrowing the purposes of education at large (Lingard et al., 2003). As part of the bureaucratic/managerialist discourse, technology has played a central role, through the proliferation of websites – government, local authority and commercial – which disseminate centralised policy-making, co-ordinate the standardisation of pupil and school performance by statistical analyses, and provide standard proformas for teaching and curricular content. The teachers in this study can now download entire corpora of content information for teaching, minimising the autonomous and critical thinking dimensions of their role. Teachers have, to an extent, been positioned as passive recipients of information about practice-based knowledge. Wrigley asserts that criticism of this now, however, has an ‘international strength’ based on the numbers of teachers leaving the profession (Smithers and Robinson, 2001, 2004), and the concerns of those who manage schools. For the first time there is a “genuine opportunity, despite the global drive towards ‘effectiveness’ in ‘economic rationalist’ terms, to build a movement for real improvement in education” (Wrigley, 2004, p. 242). From this optimistic perspective, how teachers are enabled to learn as professionals is core, but the potential contribution to this of CMC is currently under-explored.

Garrison and Anderson's argument that the transition from individual, primarily content-based learning practices, to collaborative, knowledge-making ones, is an 'uncertain process', helps to explain why there inevitably exists a wide range of inconsistent views on the impact on learning of this evolving medium (2003, p. 2). They argue that we are currently in the 'gradual development phase' in which participants are part of a very recent, and constantly accelerating history of change in how learning can be organised and conceptualised. The shift away from the transmission-focused 'information age' denotes an altered perception of people as having the capacity for agency, who share corporate responsibility for making their knowledge through collaborative processes. This, however, offers a fundamental challenge to the prevalent centralist models for teachers' professional learning which have dominated in England for the past decade.

To add to the disjunction between claims made for new technologies and contexts affecting teachers as learners, there is relatively little conceptualisation of *how* CMC affects the learning of participants, and still less explored is the impact of this on teachers' professional learning. CMC may have brought about changed power relations in the ways in which knowledge can be created and disseminated, but in the world of teachers in England today, this is scarcely their experience. It is into this unstable world of evolving conceptions and paradoxes that I enter as researcher and teacher-educator.

1.4 My relationship with the case

My own relationship with the research has been affected by my involvement in the MTeach, sharing as I do, a professional goal to enable teachers to 'think differently'. In articulating 'I-as-researcher' (Schostak, 2002, p. 10), my personal and professional orientation to the research makes explicit the investment I have in it as a form of case approach which can be described as 'intrinsic' (Stake, 1995, p. 3). Koehler et al.'s (2004) concept of 'technological pedagogical content knowledge' ('TPCK') aptly describes my own learning investment in the research as a practitioner. Their adaptation of Shulman's (1986) concept of 'pedagogical content knowledge' argues for the transformation of

practitioners' understanding of the relationship between content and pedagogy through engaging with technologies. My own TPCK has undergone considerable change throughout the research. Exploring the constructivist properties of online discussion has brought with it a reassessment of my role as a tutor, of belief in non-interventionist practice and disputation of prevalent models for 'e-tutoring' by the 'expert' as the 'key' (Salmon, 2000; Laurillard, 2002) to successful online learning. My 'view' as the researcher is informed by my involvement in a process of bringing about change, by teaching on a course which is premised upon constructivist pedagogies and a philosophy of teacher learning which sets out to counter reductivist discourses of teaching. It is further informed by my scepticism of deterministic beliefs about technology. Although it can be argued that herein lies the basis for an action research model into design for learning with technologies, that is not the prime methodological intention, and for that reason the label 'intrinsic' case study is not sufficient to introduce the research. The rationale for the research is an attempt to contribute to theory-building in the rapidly evolving field of learning with new technologies by examining the ways in which discussing in a text-based online environment impacts upon teachers' professional learning, with a particular focus on its potential for aiding an agentive conceptualisation of their role. To this extent there is also what Stake (1995, p. 3) calls an 'instrumental' intention in the case approach, working with the case context to examine an issue which exists independently of it, and the study is located in both sets of interests.

1.5 Individual and social perspectives on learning with text-based CMC

Since the conceptualisation of CMC offered here invokes an essentially social view of meaning-making through text-based interactive practice, the research has drawn on social theories of learning, and examines whether CMC can act as a catalyst for the construction of professional knowledge. I explore what happens if Warschauer's notion (1999, p. 5) of CMC as 'a potential intellectual amplifier' is applied to the context of professional development, and explore in what ways the electronic discussion forum fosters the professional development of teachers, by helping them acquire the 'intellectual assets' (NERF, 2001) which help constitute forms of professional knowledge in contemporary

teaching contexts. Online communication may offer an alternative to teachers developing a ‘delivery capacity’ for managing reductive, centralised, serial responses to inevitable change. The research will draw on recent assessments of crises in the notion of ‘professionalism’ in contemporary teaching (Furlong et al., 2000; Moore et al., 2002; Sachs, 2003a; Sachs, 2003b), which forms the main socio-political context for the teachers’ learning in the study.

The teachers as individuals *per se* are not the focus of the study, in that I am not approaching the inquiry within a biographical perspective on their learning as people with unique identities. I set out to explore to what extent the group has constituted a corpus of knowledge that has been redefined through online discussion. Central to this, is the notion that CMC not only acts as a medium of learning, but it is also constitutive of that learning, affecting the construction of ideas (Lapadat, 2002) through processes of shared negotiation of meaning and fostering of provisionality. I aim to explore if and how learning is affected by the interactive text-based practice of CMC itself, through which teachers form a community of learners. The questions asked of the online community have implications for who owns the learning and the knowledge that is produced – in the context of the MTeach, it is not handed out from the university and, importantly for teachers in the current climate, neither is it from central government. The relationship between professional learning as something which is individually experienced, and as something which exists as a socio-cognitive entity has been recognised in my approaches to reading the online textual material. I have adopted different reading positions (Freund, 1987) in my analysis of the online postings, viewing them as both artefacts produced by individuals and as products of community, which has been central to the development of a methodology for examining the data. An initial reading of the online contributions identified by author, was rooted in the concept of a coherent relationship between the individual and their textual output as determining meaning. However, Warschauer (1999) focuses on the ‘intersection’ between interaction and reflection as being “of critical importance in cognition” (p. 5). This suggestion that ‘intersection’ is central revises an understanding of online texts as products of community. Intersection indicates the teachers as jointly affecting the meanings of professional phenomena, in which it is the meanings themselves which are of primary relevance to the research question into the impact of CMC on professional learning, rather

than the multiplicity of individual transformations which may or may not take place. The significance lies in the inter-relationship in CMC between individual thinking and the social context in which it occurs. It is from this position that I came to appreciate the contribution to be made to the research by an examination of community perspectives on learning, particularly Garrison and Anderson's (2003) concept of an online 'community of inquiry' and Wenger's (1998) concept of Communities of Practice (COPs). From different fields, both of these offer a theory of learning as something which people enact together and which is realised within shared (not necessarily similar) practice. The research methodology is greatly influenced by Garrison and Anderson's model for researching an online 'community of inquiry', while Wenger's theory of COPs informs the analysis of the data, and enables the conceptualisation of professional learning within CMC as something which involves collaborative rendering of meanings which can become ascribed to professional phenomena. This is to develop knowledge which has a different function from individual cognition, and which is relevant to the research because it helps to explain how a member of an online community can learn from and contribute to an ongoing negotiation of meaning which they never possess entirely themselves as an individual, but which cannot exist without their individual participation.

1.6 Outline

The research question then, 'What is the impact of text-based computer-mediated communication on teachers' professional learning?' involves sub-categories of inquiry which are developed in the case:

1. To what extent does participation in an MTeach electronic discussion forum constitute membership of a learning community? This requires examining whether existing models for describing learning in 'communities of practice' extend satisfactorily to the context of teacher learning through CMC.
2. How do teachers engage with knowledge construction through CMC, and what are the particular features of electronic discussion that characterise this process?
3. How can electronic discussion be researched to find out answers to the above?

Chapter 2 presents a review of the literature relevant to the first two sub-categories. It examines the relationship between individual and social aspects of learning. It first examines CMC as a social and literate practice, by which communication takes place within contexts with particular social relations which affect meaning. This considers what implications arise when, given the lack of developed theories of learning within CMC, prevalent constructivist theoretical perspectives on learning are transferred from traditional face to face contexts to online discussion. Then the chapter analyses theories of teachers' professional learning (TPL) through two core concepts of community and agency. These are used to provide a theoretical focus for the inter-relatedness of individual conceptual change and social-interaction in the context of TPL. The chapter establishes what correlation exists between theoretical perspectives on TPL and CMC with a focus on the socio-interactive dimensions of each. It establishes areas of inquiry which emerge from this based on the need to understand the effects of CMC on rendering meanings among participants about what they do which affect practice.

Chapter 3 addresses the third subcategory above. It explains how I have developed the research by 'critical borrowing' (Snyder, 1998) from methodologies rooted in sociometry, qualitative content analysis (QCA) and narrative interviews. The search for a relevant methodology has been a considerable challenge, and this chapter reviews the methodological issues involved in conducting research into CMC. A rationale is presented for adopting an interdisciplinary approach, and three methods are established as relevant to the case: a sociometric analysis of the 'relatedness' between online texts; the adaptation of a qualitative content analysis model adapted from Garrison and Anderson (2003) as the main approach to examining the textuality of online discourse, through the intensive reading and analysis of coded data; and semi-structured, narrative interviews are used to elicit the participants' perspectives on their online discussions, to enable me to gauge the relationship between the text as an effect of online community, and the engagements with the texts as they are perceived by the participants themselves. The chapter examines the methods developed in relation to three data sets:

DATA SET	TIME	DATA COLLECTED
1	October 2002 – February 2003 (Participants study first MTeach module, Research and Professional Practice (RPP))	<ul style="list-style-type: none"> Maps of patterns of participation in 3 online discussions for RPP
2	October 2002 – February 2003 (Participants study first MTeach module, Research and Professional Practice (RPP))	<ul style="list-style-type: none"> RPP online discussion 1 (46 messages) RPP online discussion 2 (32 messages) RPP online discussion 3 (34 messages)
3	December 2003 February – September 2004	<ul style="list-style-type: none"> 1 pilot semi-structured interview 7 semi-structured interviews

Table 1.1 The data sets

The chapter includes an analysis of the pilot investigation. This trialled the application of the QCA model with an online discussion from a different MTeach tutor group, and led to a refinement of the QCA methods adopted by the case. QCA allowed me to observe teacher learning as a collaborative phenomenon, by coding intertextually for the content of interest, and relegating the significance of the individual author. This enabled me to identify teacher learning as a socio-cultural phenomenon and, therefore, something that exists beyond conceptions of uniquely experienced cognition, or individual attainment of skills or extrinsic criteria.

Chapter 4 presents the mapping of the online discussions, in an adaptation of sociometric theory, which establishes the ‘relatedness’ between individuals in social contexts. This is a preliminary stage in the analysis of the online discussions, in which the ‘relatedness’ between online texts is examined by developing sociograms, and a socio-centric approach to analysing the online messages is established. It analyses how the process of constructing

the maps contributed to the meaning of the data, and then analyses the maps so that patterns are identified which affect a view of ‘interaction’ and ‘community’ in relation to textual activity.

Chapter 5 examines the teachers’ messages posted to online discussions, using the adaptation of Garrison and Anderson’s (2003) QCA model for textual analysis. Social and cognitive presence is identified within the asynchronous discussion, with reference to professional learning. The chapter argues that the texts are cultural artefacts, which can be disaggregated from their authors so that their meanings can be derived from ‘hermeneutical reasoning’ (Eagleton, 2003). A theory of teachers’ professional learning within CMC is derived from the analysis, according to the model.

Chapter 6 presents data and analysis based on interviews which were conducted with the teachers during the second year of the course. It establishes the relationship between the interviews and the case development, and analyses the teachers’ perspectives on participating in the online discussions and what they learnt. The narrative approach is explained, with reference to treating the interviews as narrative data, and adopting narrative analysis of the teachers’ accounts. The chapter explores three themes which emerge from analysing the interviews, which underpin the teachers’ learning within CMC: peer relations, textual relations and relations of reification. They represent and synthesise the way CMC is experienced in relation to TPL according to the teachers’ narratives.

Chapter 7 offers a synthesis of the analysis which emerged from each stage of the case, and comments on areas raised by the research which warrant further investigation. It reflects on the generalisability of the case conclusions, and argues that the case has acted as a lens to establish further understanding of the impact of CMC on TPL. It re-interprets notions of ‘interaction’ as learning, and concludes by identifying teachers’ engagement with ‘learning as process’ as a way of conceptualising the impact of CMC on TPL within the case. By this, teachers’ learning is viewed as engagement with collaborative practices within a community, which affects identities. An enhanced engagement with ‘learning as process’ is argued to be a main impact of CMC on TPL.

CHAPTER 2: THEORETICAL PERSPECTIVES

2.1 INTRODUCTION

An analysis of relevant theoretical perspectives reflects the interdisciplinary nature of the case and is based on the two fields which are brought together in the research:

1. Computer-mediated communication (CMC)
2. Teachers' professional learning (TPL).

This chapter examines these fields and establishes their core features, which are developed as the basis for identifying TPL in the teachers' online writing. The literature in both these fields contains commonalities which underpin the development of a coherent theoretical approach to researching the impact of CMC on TPL. This chapter examines these commonalities and explores how they engender community perspectives on learning, and involve agentive ways of thinking among participants. It begins by establishing the arguments for constructivism as a relevant theoretical foundation for investigating both TPL and CMC. The premise of constructivist theories of learning is that new knowledge needs to be related to the learner's current understanding, without which "she is unable to make sense of it" (MacGilchrist et al, 1997). Within the spectrum of constructivist perspectives on learning, from those based on psychological and individual cognitive development to those concerned with the collaborative making of shared knowledge, this research is informed by *socio-constructivist* theories, which focus on how learning is a process of individual and shared meaning-making within social contexts. My focus on this as a theoretical foundation is based on my role as an MTeach tutor, which has involved designing collaborative learning tasks based on these principles, and is informed by my history in English teacher education, based on theories of the relationship between language and learning within socio-communicative contexts. The chapter explores how that which is 'known' carries a shared orientation towards its meaning, arrived at through collaborative processes which are conducted through language. Socio-constructivist perspectives on TPL rely upon the premise that knowledge about practice is a joint possession, as well as something which individuals hold in their heads and which they enact in classrooms. This

is a complex theoretical position in relation to teachers as practitioners and participants in CMC, and I have found it necessary to extend beyond the discipline of education to explore the concepts that are necessary to address the research focus.

Thus the literature is partly drawn from the discipline of education but also draws on socio-constructivist theories of community and non-formal and work-based learning, and assesses their relevance to examining TPL in the context of CMC as a social and literate practice. Ideas about learning and CMC have been applied in other educational contexts, but have been under-explored in the field of *professional learning* within formal education contexts. By examining these two fields, the case, has developed a stance towards teachers' learning which involves concepts of community and agency as core to the learning of teachers.

The chapter first provides a rationale for why CMC develops within the case as a socio-constructivist interactive practice, and in particular one which is literate, rather than a technological or media phenomenon. I explore why a conceptualisation of learning with CMC as a literate practice is central to the study and underpins the theorisation of CMC and its impact on TPL. Much of the literature on learning with CMC is based in prevalent socio-constructivist theories which invoke literacy, both oral and text-based. These are examined to establish how CMC contributes to what is described as a 'way of talking' within practitioner communities, which becomes central to developing a theory of TPL where CMC can contribute.

The chapter then explores key concepts in TPL. These are numerous, and I have drawn upon those which are concerned with bringing about change and have a future perspective within contemporary analyses of what it is that teachers should know and practise. Notions of professional identity emerge as important and are related to an ethical orientation of teachers towards the purposes of education. This focus has led to the emergence of two key perspectives which correlate with the learning potentials of CMC in a practice-focused context – those of community and agency. These are used as organising frameworks for the exploration of literature in TPL. Thus this chapter introduces the broad interpretive scope, based on a range of literature, that is necessary to consider what contribution CMC can make towards transforming teachers' professional knowledge.

2.2 CMC AS A SOCIO-CONSTRUCTIVIST LEARNING PRACTICE

The aim of this section is to explore the basis for treating CMC as a socio-constructivist learning practice. It will examine the claims made for CMC as impacting on the construction of knowledge within interactive social contexts. It will then focus on the literate features of CMC and how these are essential to its constructivist properties. It will analyse how learning with CMC may be part of a continuum of language-based learning practices which have relevance for TPL. The theoretical perspectives on text-based CMC will be analysed to consider their relevance to learning within professional communities with particular reference to Communities of Practice.

2.2.1 The claims made for CMC as a constructivist learning practice

Within the extremely broad scope of technologies in education, CMC has been classed within constructivist pedagogical theories of learning with new technologies. As a constructivist practice, it has been described by Harasim (2000, p. 53) thus:

...the student presents, defends, develop, and refines ideas. To articulate their ideas, students must organise their thoughts and information into knowledge structures. Active learner participation leads to multiple perspectives on issues, a divergence of ideas, and positions that students must sort through to find meaning and convergence. Cognitive growth and development of problem-solving skills depend on epistemic conflict, that is, the collision of adverse opinion... Students encounter opportunities to experience and resolve academic controversies in the online discourse environment.

This defines CMC as a collection of practices with a variety of cognitive effects which together are summarised by Laurillard (2002, p.67) as embracing “knowledge as a social construct”. In other words, for CMC as a *constructivist* practice, knowledge is not fixed: understandings are based on the ways in which knowledge of the world is shaped by the ways in which it is experienced and communicated. Experience constructs knowledge and challenges notions of an objective reality, allowing learners a greater degree of agency in how they develop and allocate meanings to phenomena. CMC is a *socio-constructivist* practice by which learners interact through the social and the textual, the individual and the social, the private world and the public, as a means of constructing knowledge. This relationship between individual cognition and social interaction is argued by Garrison and

Anderson (2003) to be at the heart of the ‘educational transaction’ – the socio-constructivist essence of CMC:

...an educational experience has a dual purpose. The first is to construct meaning (reconstruction of experience) from a personal perspective. The second is to refine and confirm this understanding collaboratively within a community of learners...the transaction reveals the inseparability of teaching and learning roles. (Ibid., p. 13)

Whilst acknowledging knowledge as a ‘social artefact’, Garrison and Anderson insist that “it is the individual learner who must grasp its meaning or offer an improved understanding” (p. 13). This focus helps to distinguish what is relevant to this study within a burgeoning literature on learning with new technologies. This relationship between the individual and the social aspects of CMC is core to TPL. Through this it is possible to explore Warschauer’s notion (1999) of CMC as “a potential intellectual amplifier” in the context of professional development, i.e. aspects of CMC which contribute to some form of personal transformation and agency, of learning with fellow practitioners through processes of making meaning within the online community.

Garrison and Anderson draw on Dewey (1938), citing his work on the interdependence of the individual and society as central to their development of the concept of a ‘community of inquiry’ as “a community where individual experiences and ideas are recognised and discussed in light of societal knowledge, norms and values” (2003, p. 4). Their ‘community of inquiry’ in CMC is a model which is rooted in Dewey’s transactional perspective on learning (2003, pp. 21-22):

...both reflection and discourse are utilized to facilitate the construction of personally meaningful and socially valid knowledge...a community of learners is an essential, core element of an educational experience when higher-order learning is the desired learning outcome.

The critical point about participation is the connection between the individual and the social, so that learning is seen as meaningful and agentive, provoking intellectual growth within a community context. They argue that, within a community of inquiry, ‘cognitive independence’ and ‘social interdependence’ are simultaneous and inseparable, and together constitute learning (ibid. p. 23). A shared, community perspective on intellectual growth

however, has a problematic relationship with concepts of TPL. Within TPL, the ‘fragmentation of the profession’ (Doecke and Gill, 2001, p. 8) is viewed as a barrier to intellectual growth. Certainly, a shared context for knowledge construction has been argued to be the key to effective intellectual engagement with practice (Sachs, 2003a; Sachs, 2003b; Lingard et al., 2003; Moore, 2004). Socio-constructivist processes for learning however are still not well understood in either TPL or CMC. The claims for CMC are great but despite these, and its proliferation in HE, it has been acknowledged that “what is surprising, and cause for concern, is that we know so little about the use of this medium to facilitate learning” (Garrison and Anderson, 2003, p. xi). In fact, there is evidence that caution is needed in resisting rhetorical claims for the effects of CMC on achieving knowledge-making processes which are democratic and provoke agentive thinking. The realities of the impact of CMC on learning generally are much debated. Laurillard (2002) argues that greater scrutiny is needed of whether CMC can “succeed in enabling learning” (p. 148) through collaborative practices:

It remains a strong belief, given new impetus from the significance of ‘communities of practice’ (Wenger, 1998)...but...the properties of a medium do not determine the quality of learning that takes place (*ibid*).

The same caveat is emphasised with reference to professional learning in CMC by Fayard and DeSanctis (2005): “little is known about the evolutionary dynamics of conversations and how these interweave to produce an ongoing, self-sustaining professional development forum” (n.p.). Rovai’s survey (2002) of the learning effectiveness of CMC in HE concluded that it is the pedagogical design of the course that matters more than the practice itself, i.e. there is no intrinsic impact on learning of CMC. It is not sufficient to focus on the technological aspects of CMC as liberating participants from the conventional constraints of time, space and physical context which provides altered conditions for the learning transaction. The potentials of CMC need to be viewed within the particular context developed by the case, that is within the contemporary world in which the teachers in this study practise and learn, and the conceptual complexities of TPL raised in the literature against which the impact of CMC must be analysed. To take this further the relationship between the textual properties of CMC and the social interactive ones is important for exploring its potential to effect learning which is ‘conceptually rich’ and capable of impacting on the intellectual dimensions of TPL.

2.2.2 CMC as a literate learning practice

The learning potential of text-based CMC has at core the fact that it is a practice based on exchanging language. The textual and social interactive aspects of CMC are frequently described as mutually defining and inseparable elements of learning: “Computer conferencing and networking enable communication that is best described as a form of discourse-in-writing” (Harasim, 2000).

Although it is now almost *de rigueur* to claim that CMC is the natural heir of face-to-face collaborative learning practices, (e.g. “At the core of the e-learning context is a collaborative constructive transaction” (Garrison and Anderson, 2003, p. 4)), the notion of a ‘continuum’ in literate practices needs to be explored. Whilst electronic discourse uses language that is on a continuum between speech and writing, the relationship between electronic writing and the properties of speech and writing is ‘uncertain’ (Snyder, 1998, p. xxvi). Within this still developing field, claims have been made for online asynchronous text-based exchange as a ‘way of talking’ between participants who are ‘conversationalists’ (Lapadat, 2002). The concept of CMC as a ‘hybrid’ practice is important to a conceptualisation of participants ‘talking’ or ‘telling’ within a professional learning context. By ‘hybrid’, spoken and written socio-linguistic practices are brought together (Baron, 2000), thus allowing for informal or freer exchange as ‘conversation’ as well as crafted academic discourse, creating a new context for learning which blurs the boundaries of formal and informal uses of language for learning. With CMC, participants are *writing* within practice in order to ‘tell’ but it is the *multiplexity* or hybridity of writing as email (*ibid.*) that allows the properties of written language to appropriate and adapt the properties of talk. On this basis CMC has been argued to incorporate a ‘spectrum of resources’ (Finnegan, 2003) or literate practices which operate in online interaction to affect learning. Lapadat (2002) argues that it is the ‘conversational’ property of talk as interactive and continuous which is adapted by CMC and which facilitates learning. Lapadat’s ‘characteristics’ of the asynchronous conference result in “interactivity and continuity that have the ‘feel’ of conversation” (Lapadat, 2002, n.p.). The ‘feel’ of the conversation is altered however, by asynchronous exchange. This is largely, Lapadat argues, because CMC confers participant control over thinking processes, which makes deeper engagement with

concepts possible through the effects of writing and reading messages within the space allowed by time-lapse between postings within a structured, topic-focused environment. The emphasis on the textuality of the conversation is core to developing ideas about the constructivist properties of online discussion:

...the time lags involved between logging on and taking part, encourages (users) to consider and think about the messages they are receiving before replying...with text-based conferencing it is possible to 'rewind' a conversation, to pick out threads and make very direct links. Therefore online discussions have a more permanent feel and are subject to reworking in a way more transient verbal conversation cannot be. (Salmon, 2004, p. 17).

Similarly Lapadat (2002) has based her arguments for the constructivist properties of asynchronous CMC on conversational behaviours being altered by time-lapse, which enhances learning potential:

Because the asynchronous medium relieves the conversationalists of the constraints of communicating in real time, there are some interesting consequences for the kinds of thinking, writing and discursive interaction that take place (p. 5).

These 'interesting consequences' have been central to this study, but the relationship between CMC and learning is far more elusive than these descriptions suggest. The reservations expressed by Laurillard et al. query the status of CMC as a form of written 'conversation' that leads to learning. To establish the impact of CMC on TPL requires first that the case examines the prevalent underpinning theory of the social construction of knowledge which is relevant to text-based learning, and to consider whether it is possible to transpose such a theory to this case and what degree of adaptation is needed. It is important to address the 'literacy' base of CMC in its own right, to establish what foundations there are for transposing constructivist theories of learning from spoken and written contexts of language exchange to an online context for TPL.

2.2.3 Language and knowledge construction

2.2.3.1 Vygotskian perspectives

Central to the ‘making of knowledge’ is the need for a representational tool by which concepts may be developed through interaction between learners. Socio-constructivist views on the development of knowledge have been developed from Vygotsky’s seminal work *Thought and Language* (1986) on the development of concepts that takes place within individuals through communication with others within social contexts via language.

Vygotskian views on concept formation centre on the ways in which the word acquires ‘significative use’, and is prompted “not from within but from without, by the social milieu” (1986, p. 108). “While meaning stands for socialised discourse, sense represents an interface between one’s individual (and thus incommunicable) thinking and verbal thought comprehensible to others” (1986, p. xxxvii). Theories of socially constructed knowledge have taken as a premise that coming to ‘know’ something is not an act of individual cognition alone, but is a process of engaging in the social world and mediating the sense that is made of it through some form of sign which is communicable to others, which may be the spoken or written word. Mercer’s analysis (1995, p. 4) of how Vygotsky described language as a ‘*psychological tool*’ adds a socio-cultural dimension to it by defining language as an essential ‘*cultural tool*’: “we use it to share experience and so to collectively, jointly, make sense of it”. This is the core of meaning-making processes based on language.

2.2.3.2 Mercer’s adaptation of Vygotskyian theory to education contexts

Merger’s development of Vygotskian theory is important to the case development because he applies ideas of the relationship between language and concept formation to formal educational contexts, and offers analyses of spoken interaction in which exchanges between individuals are scrutinised for what they can show about how learning is happening in participatory practice. He insists that the two central functions of language are not separate, and that the cultural one (communicating) and the psychological one (thinking) come together in order for people to “think and learn together” so that “individuals can formulate ideas and communicate them” (ibid). Thus, learning is viewed as both individual and social, and dependent on the interplay between the two. Mercer argues that the nature of learning through spoken language interaction in constructivist contexts is so complex that we are a long way from a developed theory of how it happens, but he offers a ‘sketch’ of what it might look like, the principles of which are significant for adaptation to the context of text-

based CMC to enable members of professional communities to learn with and from each other:

Talk is used to construct knowledge. This is a social, historical process, ... the knowledge that is created carries with it echoes of the conversations in which it was generated... knowledge can be created out of the conflict of ideas as much as through accumulation and combination of them...conversations in which people are self-consciously trying to teach and to learn will have special characteristics... The concept of 'scaffolding' is useful for describing how one person can become actively involved in another's learning activity, in such a way that the learner has an active role and yet is able to progress further and more easily than they could have done alone. (ibid. p. 84-85)

This 'sketch' helps to justify what underpins the term 'conversation' in hybrid accounts of CMC, but Mercer urges caution in transferring ideas about knowledge construction from one educational context to another, and I have considered the difficulties in viewing CMC as an uncomplicated 'heir' to constructivist theories rooted in face to face contexts. Mercer is dealing with spoken language, but his sketch has a strong correspondence with the text-based CMC context, in terms of its focus on language exchange and collaboration as *prime* sources of learning, and its context within formal education parameters which have brought people together to achieve specific learning goals. To scrutinise *how* participatory practice impacts on learning, Mercer borrows from Bruner's¹ theory of 'scaffolding', which describes the ways in which a more knowledgeable adult carefully supports the learning of a child by the quality of the way in which he or she intervenes in the development of ideas, by careful and judicious dialogue. This persuasive concept of how one person can participate in the learning of another has been widely applied to educational contexts, but with variable attention to the quality and nature of the interventions, and to their being language-based. It was intended to explain how an individual 'expert'/teacher can impact upon the learning of others who are less knowledgeable. Mercer adapted the notion because of the active role it ascribes both teacher and learner in the contexts he was examining, but warns about its casual wider application. The concept must be reinterpreted if it is to help understanding of what happens between participants who are 'equals' as learners, but who undoubtedly learn from the interventions made online in each other's thinking and the adoption of lead-thinking by different individuals at different times. CMC is premised on

¹ Wood, D., Bruner, J., and Ross, G. (1976) The role of tutoring in problem-solving *Journal of Child Psychology and Child Psychiatry* 17, 89-100.

the capacity of participants to intervene in the contributions of others. The concept of scaffolding offers one way of understanding those who choose to adopt more ‘teacherly’ roles in their interactions, and seek out opportunities to invite their peers to consider differently, or interject with questions which are not easily answered. This is far more subtle than ascribing terms like ‘activists’, ‘pragmatists’, ‘theorists’ or ‘reflectors’ (referring to Salmon’s adaptation (2000, pp. 72-73) of Honey and Mumford’s (1986) typology of learning styles) to the learning roles adopted by members of the CMC environment. It also looks beyond Schwienhorst’s emphasis (2002, 2003) on the internal processes located in different learner-orientations in CMC, where he categorises learners as ‘intentional’, ‘communicator’ and ‘experimenter/researcher’. It is here that the case has resisted identifying different ways of interacting as ‘behaviours’ or ‘typologies’ of personal traits. The idea of ‘scaffolding’ as an enhancing social learning practice has to be adapted to be reinterpreted for the CMC environment and to help understand the impact it has on teachers’ learning, where the relations for learning are different than those between teacher and pupil, but where there is evidence of the affective impact of participants’ dialogue on the thinking of others. Mercer (1995) explains that “A great deal of [education] is learning how to use language – to represent ideas, to interpret experiences, to formulate problems and to solve them” (pp. 72-74), and this has strong relevance to examining the means by which language is used by teachers to construct knowledge in asynchronous CMC through ‘joint thinking’.

2.2.4 Writing and learning

2.2.4.1 Writing as a cognitive tool

Whilst ‘joint thinking’ is key to Mercer’s socio-cultural contribution to a conceptualisation of learning with CMC, a range of theories contribute to linguistic analyses of the role of interactive writing in learning. Kress (2003) explains that writing shares with spoken language a dependency on meaning-making via the ordering and organisation of action-like entities and object-like entities, and relations of ownership inform how the world is represented in both modes. Causality is implied through the hierarchical notions inherent in grammatical organisation of sentences. The same is true of spoken linguistic structures, but writing has “inherent and demonstrable advantages over speech when engaged in critical

discourse and reflection" (Garrison and Anderson, 2003, p. 25) because it is a permanent record, is more systematic, exploratory, and attentive to others' views. As a 'way of talking' however, speaking and writing share a common basis for re-presenting the participants' experiences and working out what they mean.

Written text online therefore offers an ordering of human experience which both retains the grammatical and lexical features of conventional writing, and at the same time is generated within new contexts of production which enable extended thinking. In terms of internal grammatical organisation of text, there is a stable means of representing meaning, or orthodox literacy at play – the sentence from the electronic archive, "I do not agree (as it would seem most of the group would not) with [teacher] who does not think it necessary for teachers to be research literate" remains the same in lexical and grammatical coherence, regardless of whether it is spoken or read as part of an online discussion or within this printed text. Meaning is embedded in the ordering of subject, verb and controlled action, by 'causality' which Kress insists is intrinsic to communication in the written or speech mode. To learn within these modes, participants are concerned with filling words with meaning, and I am doing the same as tutor and researcher:

... 'filling with content' is a contentious view of the lexical element 'word'. It assumes that words are signifiers, not signs – that is, that they are forms with potentials for becoming signs. The 'filling with content' is then based on our prior experience of such elements. (Kress, 2003, p. 37).

When teachers 'lexicalise' their experiences and ideas, sense-making comes into play in the way they have to construct thoughts into meaningful language that can be communicated in the social context of CMC. In the case approach, this requires analysis of the effects of narrating teacher experience which is situated, and of how asynchronous exchange affects what gets said and what it means for participants. The case means that the language cannot be looked at in isolation from the context in which it is produced, as this is essential to meaning-making processes which are rooted in language exchange. The text contains evidence of conceptual content within the writing, and identifying it is dependent on the hermeneutical properties of written language to render things meaningful by the reader's interpretation. Teachers can be seen to 'talk' online through writing, sharing a signification system which enables us to think of what is exchanged as a way of talking. The importance

of the written dimensions of this to achieving ‘intellectual amplification’ is examined in the next section.

2.2.4.2 Writing as intellectual amplification in CMC

The properties of writing, as utilised by asynchronous electronic discussion, affect learning through raising consciousness, reworking and reconceptualising experience (Ong, 1982; Olson, 1994), “Writing intensifies the sense of self and fosters more conscious interaction between persons” (Ong, 1982, p. 48). Writing as a practice offers time to reflect, involves re-thinking, and uses language as a way of shaping thought (Kroll, 1981). Asynchronous email messages can harness the properties of written language to aid thinking in ways that speech cannot do. It is the extension of these properties which is at the heart of the claim for the effects on learning of the literate practice of CMC. It makes writing an *interactive* literate practice, the properties of which are examined here for how they contribute to intellectual activity in a way that this study has seen as growing out of the ‘dynamic textuality’ of CMC.

CMC as an interactive literate practice allows the adaptation of interaction-based theories of language and knowledge construction which have their roots in Vygotsky’s work. This is about *evolution* in learning practices within a conceptual continuum based on the properties of language to enable the construction of thought, within spoken, written and email exchange. The asynchronous time-lapse facility of CMC is the central element here, where Garrison and Anderson (2003) argue that “students have more time to reflect, to be more explicit and to order content and issues” (p. 26). This is a clarification of what Lapadat means by her use of the metaphor that interactive writing ‘bootstraps the construction of meaning’:

An integral element in the conceptual development that takes place in...online courses...the interactive textual environment...is particularly facilitative of both social and cognitive construction of meaning because the nature of interactive writing itself bootstraps the construction of meaning (2002, n.p.).

Because writing in asynchronous conferences adheres to the semantic and graphical organisation of formal written language, Lapadat argues that “individuals must use their

literate knowledge to participate. Furthermore, the process of participating in asynchronous online conferences enhances literate forms of higher order thinking in specific ways" (2002, n.p.). By 'literate knowledge' Lapadat is referring to the range of ways that language enables participants to 'think' through reading and writing. It places text-based CMC on a continuum of learning practices with conventional writing, whereby "writing enables us to say and think things that we could not, or at least have not, said and thought without writing" (Olson, 1994, p. 288). Lapadat's work focuses on the 'literacy' of the writing, stressing the continuities between conventional and online interactive text, i.e. both are 'content-laden' and 'lexically dense'. Herein lies the essential argument for how the content of online writing brings particular intellectual focus to what gets said as a 'way of talking' within electronic text which is 'dynamic'. Writing online requires developed literate responses to the presence of others, "perspective-taking as well as metalinguistic thinking – thinking about language, how their words will be taken, and how to use them to accomplish their purposes" (Lapadat, 2002). Time lag is central to this. Written text takes longer to compose than spoken comments, because of the complex conventions that constitute writing (graphical and genre-related), and because usually, more time is available to construct thinking than in spoken situations. Therefore, extended thinking time is built into the production of asynchronous written text, thus affecting it as a dynamic entity for learning. The malleability of the medium allows the re-working of ideas and the ways they are communicated in writing. Attention to the *language itself* in online exchange becomes crucial to examining the learning which is taking place through the dynamic of the textual and social practices. The literate aspect of text-based CMC demands a close examination of language and meaning-making to establish the learning of participants and must inform the development of the methodology in the case.

Central to this focus on the relationship between the conceptual properties of CMC and the dynamic of the text, is a further element of the effects of what Lapadat (2002) calls 'audience' for meaning-making in literate exchange. Writing for a 'real' audience affects the motivation to enhance the communicative power of the text. Lapadat argues that participants place "high premium" (2002, n.p.) on the quality of the writing, which results in greater reflection and critical thinking that is audience-aware. The production of a permanent electronic manuscript is therefore argued to have a central role in learning, as it facilitates a conscious engagement with language that can be subjected to interpretation and

re-interpretation. The fact that participants can appropriate and adapt material from the textual archive into their own writing means that notions of individual authorship and intellectual possession become complex, and the community aspects of writing online emerge as important to socially-constructed knowledge. The key issue for TPL here is to what extent this textual practice helps constitute thinking which is relevant to professional learning, and which is therefore related to agency and reflexive ways of learning based on articulating experience and professional action. Theoretical arguments propose that CMC has a democratising potential and can invoke agentive and critical dispositions through the enhanced opportunities for making meaning in interactive textual exchange. This is highly relevant to agentive possibilities for TPL in contemporary contexts in which independent and critical thinking have been limited. The kinds of intellectual activity which constitute TPL are analysed in the following section, 2.3.

2.2.5 Summary

The socio-cultural concept of ‘joint thinking’ is central to an analysis of CMC as a literate learning practice and invokes the concept of community as constitutive of thinking. This term has emerged as apt to capturing the social aspects of conceptual work which are core to this case. It is a term which indicates the potential continuities between theories of socio-constructivist learning which pre-date online discussion, and text-based CMC. CMC as a ‘hybrid’ form of literate practice based upon graphical and semantic ordering of ideas in written text confers powerful intellectual capacities upon participants. These are argued to be amplified by asynchronous engagement with ideas in written form, in which dynamic textuality contributes to learning. Both joint thinking and textual literacy contribute to a conception of CMC as impacting on learning, but Mercer has urged caution in the general application of constructivist theories to new modes of communication. Theory-building in CMC should proceed with discrimination in transposing concepts from one online context to another, so unique are the conditions which constitute knowledge construction in an online community (as they are in a face to face community).

Two crucial elements emerge in developing an analytical perspective in the development of socio-constructivist theory as applied to CMC. The first is Mercer’s emphasis on the process of learning to share and construct new knowledge together through talk as ‘joint

mental effort'. The second is the role of written language in CMC as potentially amplifying intellectual processes of meaning-making. Mercer insists that because humans can talk, "in the study of learning... amongst all living things we are uniquely equipped to pool our mental resources and solve problems – to create knowledge" (1995, p. 1). The link from pooling mental resources to creating knowledge is vital, but the case development must be discriminating in transposing ideas about 'pooling mental resources' to shared online instances of 'talking' where teachers communicate through written language. Learning in CMC needs to refer to both literate interaction with peers which affects cognition, and to community-building, which fosters joint understandings of shared intentions and values. The multiplicity of ways in which individuals experience 'community' in the construction of knowledge makes it unwise to attempt an analysis which is not located in the specifics of the context and the individuals.

This is the foundation for developing a theoretical perspective on learning with CMC which can be used to examine what exactly lies in Lapadat's term 'bootstraps' in the context of teachers' learning on the MTeach. Participatory practice enables participants to engage in interactive 'thinking' behaviours based on shared intellectual activity, involving 'scaffolding' and argumentation, by which ideas are adapted and modified as part of ongoing community-building. Whilst there are strong arguments for the impact of these constructivist processes on conceptual change in online contexts, there are key issues of the kinds of *intellectual* activity which needs to be identified and also the social relations embedded in online content which affect the nature of the educational transaction in this case of TPL. It does not necessarily follow that independent and agentive thinking result from CMC. To develop the theoretical perspectives further, it is necessary to examine literature on what constitutes TPL, how this is relevant to joint mental effort, and the role of social practices for TPL which enable teachers to 'pool knowledge' through language.

2.3 TEACHERS' PROFESSIONAL LEARNING (TPL)

The aim of this section is to explore theories of TPL within contemporary contexts. It situates TPL within contemporary political and historical discourses of teaching which affect concepts of what teachers should know, practice and talk about in a learning context.

Within these contexts this section examines how the nature of TPL is conceptualised in relation to increased regularisation, and is debated. From this relation between TPL and contemporary contexts, I have identified two major conceptual strands in the literature which are strongly inter-related with ideas about CMC as a democratising entity, and which have socio-constructivist bases:

- i. concepts of community
- ii. concepts of agency.

These form an organising framework for examining the literature on TPL. Both dimensions contribute to a theorisation of TPL which is concerned with practice as a complex and shared intellectual activity rather than a matter of performance of skills. In developing an examination of these dimensions, it becomes apparent that both community and agency contribute to the theoretical perception of teachers as developing an ability to act upon the world and CMC is explored in relation to these concepts.

2.3.1 Contemporary contexts for TPL

Literature which addresses TPL in current contexts reflects how it has evolved in relation to managerial and performance-oriented concepts of teacher professionalism (Pachler, 2007) which have dominated policy-making in the 1990s and early twenty-first century. This provides a paradoxical context for the formulation of agentive theories of CMC impacting on TPL, which adopt a counter-position towards dominant discourses of professional knowledge and how it is developed.

Pachler refers to how Hoyle's concept of 'professionality' (Hoyle, 1974) is still relevant within current contexts, emphasising that TPL involves the development of the "knowledge, skills and procedures employed by teachers in the process of teaching" (Hoyle, 1974, cited in Pachler, p. 243). The terminology surrounding professional learning can be confusing, and the terms 'professional learning', 'professional development' and 'professional knowledge' are sometimes presented in the literature as interchangeable. The term 'professional learning' is used here to indicate experiences which have some effect of altering or increasing the professional knowledge which is drawn on in practice. It implies a

depth and breadth of learning which is not always present in the current use of the term ‘professional development’ which has become a key government descriptor of an increase in pre-determined skills linked to career progression and successive levels of competence (Training and Development Agency, 2005). This represents a shift in the meaning of the term since the early 1980s:

Professional development consists of all natural learning experiences and those conscious and planned activities which are intended to be of direct or indirect benefit to the individual, group or school and which contribute to the quality of education in the classroom (Hoyle, 1980).

The current relegation of ‘natural learning experiences’ in favour of ‘conscious and planned activities’ and of ‘indirect benefit’ in favour of ‘direct benefit’ is highlighted by target-driven professional development review structures which demand the achievement of externally imposed goals. There are limitations on intellectual growth in the far-reaching change in the professional knowledge base since the early 1990s. A conception of professionalism has been established in which autonomy (intellectual and practical) is reduced and “where teachers are highly competent practitioners, proficient in working in ways that they considered appropriate to schools facing the demands of a changing national and global economic context” (Furlong et al. 2000, p. 142). The competitive, functional and performance-focused concept of what teachers need to know in order to practise is now embedded in the infrastructure for teachers’ professional development via achieving ‘standards’ from ‘cradle-to-grave’ (Department for Education and Skills, 2001; Training and Development Agency, 2006), and has permeated all aspects of career practice and progression. These changes have been conceptualised by Lingard et al. as bringing a ‘hollowed-out depthlessness’ (2003, p. 13) to current discourses of teacher learning – or ‘development’ which now implies a linear progression, characterised by an emphasis on proven performance of skills and competence-based knowledge which is readily observable (Mahony and Hextall, 2000; Ball, 1998).

The MTeach as a context for the study was established within this climate in many ways as a counter to the dominant competence model of professional learning. It is based on the collaborative development of informed criticality based on actual practice. Any case of teachers’ professional learning in this context, must refer to the complex interplay between

politically-driven extrinsic notions of professional learning and the teachers' developing understandings which are rooted in their experiences. Very differing stances exist within the literature towards this interplay. Saunders (2004, p. 117) argues that "teachers are learners par excellence" and can be skilful in negotiating how to implement their developing knowledge and understanding within systemic constraints. Saunders's perspective on teachers as learners assumes that the conditions for professional learning are in place to support teachers as critical inquirers, but this is not necessarily the case within politically determined models for teacher learning (Reeves et al., 2005). There is considerable division concerning what constitutes 'professional knowledge' and the contexts and learning experiences which are deemed to cultivate it. It is within this contemporary context that community perspectives on TPL have achieved considerable currency, but their connection with the intellectual dimensions of teaching is ambiguous.

2.3.2 Concepts of community in TPL

2.3.2.1 Theoretical perspectives on teachers' learning communities

There is a considerable drive towards community perspectives on TPL as a *concept* though the realities in England are somewhat at odds with this. Core to conceptualising 'community' as a central element of TPL, is the notion of the 'individual professional' as 'paradoxical' (Doecke and Gill, 2001). Doecke and Gill explore the potential of teachers' learning communities to "demonstrate a model of collaboration...that represents a compelling alternative to the fragmentation of the profession" (p. 8). Their work forms part of a body of work located in Australia since 2000, which places teacher learning in communities at the core of an alternative form of teacher identity, one which is 'activist' and which is part of the widespread theoretical adaptation of Wenger's work (1998) on Communities of Practice to professional learning contexts. Through the concept of a 'teaching fraternity', Sachs argues that community is essential to the development of teacher identity. It is how "its elements are learnt and communicated" (Sachs, 2003a, p. 135) and crucial to impacting on practice. 'Teachers' Professional Learning Communities' (TPLCs) (Lingard et al., 2001) include teachers, heads, pupils, parents, classroom assistants and mid-day supervisors in a focus on the 'de-privatisation' of professional practice through an emphasis on collaboration in the culture of staffrooms and adult communities

throughout the school. In England however, the concept of a ‘professional learning community’ (PLC) has only recently gained currency in practical and theoretical terms, though Sergiovanni’s (1999) theorisation of ‘learning communities’ established the features of learning communities within school contexts as rooted in bottom-up interactive practices of inquiry. The work of Fielding et al. (2005) on ‘joint practice development’ and Bolam et al. (2005) on effective PLCs, has focused on the potential impacts on teacher learning of collaborative, learner-engaged practices. The unifying theoretical assumption is that communities help constitute professional learning, which forms a shift away from a focus on individual teacher learning as a purely cognitive matter which happens through increased isolated understanding. Such teachers’ professional learning communities are based on moral concerns and shared ideas about educational purpose and ‘socially responsible goals’ (Sachs, 2003a, p.135). These collaborative concepts assume that the everyday communication between teachers and others in their communities, which is embedded in the social relations of face to face proximity, can then facilitate the development of a shared professional discourse that is essentially learning-oriented.

2.3.2.2 Obstacles to community perspectives on TPL

Within face to face contexts, currently there are obstacles to the realisation of such communities for teachers in England, who lack professional learning instruments by which to establish collegial learning practices. Pickering (2007) has identified the need for collaborative and teacher-generated opportunities for teachers to learn from and with each other, but their main experience of professional learning has been of training from an ‘outsider’, driven by centralist goals and delivered by external authorities, with minimum opportunities for teachers to talk together in ways which authorise their experiences as a source of valid learning. The same has been found in the United States and identified as ‘just-in-time support’ (Dede, 2006, p. 1). Reeves et al. (2005) have argued that, where community is ‘enforced’ through government initiatives, it fails to establish essential mutuality and shared notions of moral purpose among teachers. A theoretical challenge is to understand how concepts of community can be identified within CMC as practised by teachers within a course like the MTeach. Electronic communities for teachers have proliferated in recent years, but their capacities for engendering collaborative professional learning via CMC are not clear and theoretically uninformed. The new emphasis on teacher

‘networks’ (Johns-Shepherd and Gowing, 2007), both electronic and face to face, for example the Networked Learning Communities at the National College of School Leadership, the General Teaching Council’s Teacher Learning Academy, and their Professional Networks, is in many ways paradoxical, developing as it is in a collaborative vacuum, since school learning cultures are still increasingly determined by the fragmentation of teachers into individualistic categories of ‘Excellent’ and ‘Advanced Skills’ bands, and still compete within performance league tables and for funding. A further problematic for CMC as constituting a learning community for TPL is that the notion of the ‘group’ benefit has never been fully addressed within the current organisation of teachers’ professional learning. The concept of shared collaborative benefits as an outcome of participating in professional learning is not clearly understood by all stakeholders, including teachers when starting the MTeach. Teacher learning as a *group benefit* is also difficult to formalise when, within the university, the accreditation of learning undertaken as part of a group, with or without CMC, is still highly problematic, despite Laurillard’s (2002) recommendation that designers of online university courses should “design group assessment to fit objectives and modes of collaborative learning” (p. 207). This void in the links between community and individual professional learning is core to what needs to be explored in relation to CMC within the case.

The concept of a ‘virtual’ ‘community of inquiry’ has broad potential to foster TPL, but lacks the central focus on developing *practice* which must be at its core:

A community of inquiry is a group of people united in the examination of an area of common interest via a process of dialogue-based inquiry...it must ...contain the two essential ingredients of a process of inquiry – a self-correcting practice driven by dialogue – and a *community* devoted to that inquiry – where community evokes a sense of cooperation, trust and common purpose (Parsell and Duke-Yonge, 2007, p. 182).

Although this incorporates a sense of the literate and socio-constructivist bases for learning already examined, the essential need to learn within practice is not sufficiently addressed by generic properties of a community of inquiry such as this. Wenger’s concept (1998) of ‘Communities of Practice’ (COPs) offers a richer way of understanding the link between community and practice that is based on learning. This is through Wenger’s theorisation of collaborative processes of meaning-making and helps provide a way forward for a

community perspective on TPL which is based in shared knowledge construction. Wenger's concept of COPs is now examined to identify how its features are relevant to the practice of CMC, where CMC carries out the essential elements of text-based dialogue which renders practice meaningful.

2.3.2.3 Wenger's theory of Communities of Practice

Wenger's concept of 'Communities of Practice' (COPs) offers a theoretical perspective on teachers' learning and the potential contribution to it of CMC. Learning in a COP goes beyond increasing a functional or delivery capacity in terms of what practitioners can do, but instead places 'doing' in an agentive context of enhanced abilities to make judgements and to be discriminating in the light of shared professional experiences based on collaborative knowledge-building processes:

Becoming good at something involves developing specialized sensitivities, an aesthetic sense, and refined perceptions that are brought to bear on making judgements about the qualities of a product or an action. That these become shared in a community of practice is what allows participants to negotiate the appropriateness of what they do. (Wenger, 1998, p. 81)

In taking a theory of work-based learning within communities and exploring its potential to contribute to a conceptualisation of TPL and CMC in this case, there is a need to justify this conceptual move over established ways of considering learning through CMC in higher education contexts, for example Laurillard's 'conversational framework' (2002) or Turoff et al.'s 'conceptual discourse' (1999). What is lacking in current educational theories of learning with CMC in HE is the practice-based dimension of learning for groups of professionals. Practice is foregrounded in Wenger's social model of learning. He makes it clear that a *community* does not necessarily imply a shared *practice* and that this must be forged by the "three dimensions of the relation by which practice is the source of coherence of a community" (1998, p.72): mutual engagement, joint enterprise and a shared repertoire. These make coherence possible by being at the core of knowledge construction processes in the community. By engaging with these three dimensions, practitioners within communities become learning-oriented and are bound by social processes. *Participation* and *reification* are core to achieving this. They are twin concepts which are central to Wenger's conception

of learning in COPs as essentially social and practice-oriented. Wenger's description of learning by participation in community argues that learning "takes place through our engagement in action and interactions, but it embeds this engagement in culture and history" (1998, p. 13). By reification Wenger means that "we project our meanings into the world and then we perceive them as existing in the world, as having a reality of their own" (ibid., p. 58). They become markers, by which a community can encode its practices and share recognition and understandings of core phenomena and their political implications for how individuals can act or 'be' within that world. Reification thus refers to:

the process of giving form to our experience by producing objects that congeal this experience into 'thingness'. In so doing we create points of focus around which the negotiation of meaning becomes organised (ibid.).

This process of 'giving form' to experience is central to developing a theoretical perspective on teachers' learning in CMC and how it is characterised as a constructivist collective practice, for example in relation to teachers' changing ideas about education policy and how they enact it. If 'giving form to experience' can be enabled by CMC, then it is necessary to identify what forms are given within online writing and what potential there is for CMC to enable teachers to engage with processes of participation and reification in these terms. This is at the core of CMC as a practice by which online textual exchange can enable learning and contribute to an understanding of 'form-giving'. This is essentially an instance of knowledge construction. The concept of 'knowledge construction' (Edwards and Mercer, 1987) as a participatory activity, links the capacity for knowledge construction to the capacity for context-making where context becomes 'essentially a mental phenomenon', whereby things come into being or are known by the acts of naming – a type of 'form-giving':

Things 'out there' become contextual only when they are invoked...the very act of naming things, or of assuming shared understandings of them makes their reality for communicators a social and conceptual one. Context *is* the common knowledge of the speakers invoked by the discourse...Continuity is a characteristic of context, being context as it develops through time in the process of joint talk and action. It exists as shared memory and intention... (pp. 160-161).

This conceptualisation of common knowledge has a future dimension and an agentive quality. Its theoretical principles can be seen in Wenger's concept of reification as a process

over time by which talking within practice renders meanings to practice and forges the ‘thingness’ of phenomena. Edwards and Mercer’s argument is that context is created by communication. It is a ‘mental phenomenon’ and not a physical entity. It makes it possible for a COP to exist through CMC because, through participation in electronic textual exchange, both shared memory and future action can be brought into being. This is through literate processes by which teachers ‘fill with content’ (Kress, 2003) the language which they share within texts.

By processes of reification conducted through CMC, teachers can learn about practice as members of a COP. This means they have the potential to learn ‘how to be’ as teachers, how to achieve advocacy and how to begin to realise themselves as potential change agents. In other words, ‘practising’ as a teacher is also ‘practising’ as a member of an online community. Notions of what it is to be a practitioner are altered by Wenger’s theory, and the domains of professional knowledge and action are less distinguished between what is enacted in classrooms, and what is discussed online. The spheres of professional practice become permeable, and ‘practising’ online is part of the participants’ formulation of professional identity. Wenger’s theory of participation and reification within COPs can help to identify how, in their online exchanges, teachers ‘reify’ professional phenomena and ascribe ‘thingness’ (1998, p. 58) to everyday events within their practice. There are strong links between ‘reification’ and ‘form-giving’ in a COP with processes of ‘joint mental effort’ (Mercer) and ‘the act of naming things’ as a conceptual activity (Edwards and Mercer) based on language and interactive practice. The literate dimensions of CMC mean that participants – teachers in this case – ‘fill with content’ the online writing of their peers. Language as the articulation and understanding of experience is core to concepts of TPL in this context. This is examined in section 2.3.3, which identifies talking within a community as constitutive of TPL because of the way teachers are enabled to build reflexive and intellectual engagement with practice.

2.3.2.4 Purpose and learning in a COP

The appropriation of the metaphor of COPs from the field of work-based learning, in which individuals learn ‘through the experience of work itself’ (Employment Department, 1992),

is not unproblematic. Reservations concerning the ability of work-based learning to develop the underpinning knowledge and understanding of work roles (Black and Woolf, 1990) has led to a refinement in theorising about the complex relationship between theory and practice (Barnett (1994); Evans et al. (2002)), and it must be asked to what extent the ethical and intellectual dimensions of TPL can be adequately addressed by Wenger's dimensions of COPs. Crucially, educational contexts force us to address the *purpose* of education. Schools have roles as social institutions carrying particular responsibilities and are accountable to the societies in which they exist, and levels of 'mutual engagement' and 'joint enterprise' are not stipulated by Wenger within this perspective on values. The purpose of education needs to be seen within an ideological context, which affects the roles teachers occupy and their learning within the social order and its particular value systems and power relations. Workplaces generally do not attract the same social responsibilities where 'practice' is encoded with values which change according to the social order at the time. The substantial socio-political shift in the past fifteen years towards performance-oriented values is a particularly stark indicator of how a COP that consists of teachers will include certain behaviours and codes which are to do with current dominant educational purposes. The ethical context in which a teachers' professional learning community operates must be problematised. The shift towards a performance-oriented education system argues that government policy enforcement provides new agendas (Wrigley, 2004) which shape 'mutual engagement', 'joint enterprise' and 'shared repertoires' for teachers. The treatment of 'community' must therefore be assessed regarding how far these three principles relate to ethical considerations of purpose in the development of practice. In other words, there is a query about how far teachers are able to engage *critically* with these dimensions within online discussion and how their encounters will include discord and disruption as part of the learning experience. Disruption is a key to intellectual engagement and agency in accounts of CMC as a literate practice, based on the capacity of human beings to 'fill with content' – to ascribe independent meanings to what is written.

Criticality may be hard to achieve though, where reductive discourses of teaching and learning are deeply embedded within everyday practice in schools, so that practising CMC to enable 'telling' and 'filling with content' may not necessarily bring about enhanced critical dispositions. The processes involved in making unorthodox meanings out of practice, and developing counter-thinking, are not well explored in the literature on

communities. Surface level engagement with critical thinking is a problem in both TPL and CMC. There is nothing causal about constructivist practices in fostering agentive dispositions – for teachers or online participants. Critics of Wenger from the perspective of TPL (Reeves et al., 2005) argue that he accepts the *status quo* of power relations within organisations, so that whilst the COP may work effectively to enable social exchange, it is not carrying out transformational functions which foster criticality, challenge and change, and thus does not address the micro-political processes of change experienced by teachers in schools. If this is so, it challenges how TPL is conceived of in this case, where the practice dimensions of TPL are centrally important within ethical dimensions relating to the purposes of education. These may require disputation of prevalent ideas and orthodoxies which affect practice. The power relations at play in an online community within formal education contexts have been argued to prohibit genuine critical thinking. Power differentials between tutor and students (Laurillard, 2002; Lea, 2000) are key to this. Laurillard's assertion that the tutor is central to achieving the production of knowledge in CMC places them in a gate-keeping role to learners accessing what she terms 'second-order knowledge'. By this she means they have to negotiate their way to achieving privileged ways in which knowledge about the world has been organised into academic rhetorics or theories. By privileging these over 'first order' or experiential knowledge which is gained from direct engagement with the world, Laurillard in effect diminishes the practice-based dimensions of learning to which learners have unique access and tutors retain control over the forging of ideas. This is problematic in viewing CMC as impacting on counter-thinking and agentive learner roles. Lea (2000) has found evidence for this in what she calls 'epistemic modality'. She found that critical ways of thinking may be only at surface level in some cases of CMC. She adopted a functional linguistic approach to examining how difficult it can be for participants to engage at a meta-level with their learning in online discussion. She examines the dual functions of writing an 'utterance' online, where participants are both voicing their own beliefs and understandings about the conference topic and creating relationships with other participants, and found that disruptive or counter-thinking can be inhibited. She refines the linguistic term 'modality', which indicates a speaker's attitude towards a proposition (a modal auxiliary reveals a speaker's attitude towards what they are saying, and can imply the power relations between the speaker and the topic, for example in the use of 'should' or 'could' which often carry a qualifying function). Lea argues that "it is not just the modal verbs that matter but all the

different ways in which speakers express commitment to the truth of a proposition" (p. 78). Lea identified different attitudes between tutors and students towards the validity of knowledge in online conferences. She found that critical thinking can be hard to foster: "student contributions tended to be characterised by more tentativeness and hedging, with few categorical statements. The use of 'I agree', 'there seems to me' ...indicates epistemic modality" (p. 79). The educational transaction in CMC may be novel and productive, but students themselves in Lea's study were not clear why:

Although the conference record has the possibility of being a valuable record of reflection on learning, such a record does not necessarily have an immediate or obvious value for students in terms of their own learning. (Lea, 2000, p. 84)

Thus, the online interaction can feature a lack of meta-engagement with the learning processes. Garrison and Anderson emphasise that we still do not know enough about what it is like to be on the inside of the collaborative learning process and that in each case, such as this one of teachers' learning, there is a need to establish what it is about CMC that can foster "cognitive independence and social interdependence simultaneously" (2003, p. 23). Independence and criticality within interdependent practice is vital to TPL, and requires an ability to engage at a meta-level with the process of inquiry. Wenger's theory of COPs has needed further examination in the light of this uncertainty about the abilities of community to foster the kinds of thinking that are necessary.

2.3.2.5 Concepts of community and critical thinking

There is some evidence that within COPs the 'sustained generational encounters' between newcomers and old-hands that Wenger describes are examples of the operations of power, as is his insistence that newcomers perpetuate practice 'in their own way' (p. 99). The discussion of personal problems of multi-membership, of having to resolve 'ambivalent relations' (p. 109) between the plural communities in which participants move are all examples of the politics of participation and reification, i.e. to do with the (re)distribution of power to say what things mean which, according to Wenger, is the source of being able to practice in self-determining ways. From this perspective, it is inconclusive as to whether both Wenger's COPs and CMC can consistently apply themes of agency and critical thinking to the area of teachers' learning. The case needs to develop ways to focus on the

ways the teachers, by telling through shared online writing, interpret their everyday practice through processes of participation and reification which have agentive effects on thinking. The analysis will need to examine how far a COP can be said to exist online for teachers within an agentive conception of TPL and address the sub-category of inquiry:

To what extent does participation in an MTeach electronic discussion forum constitute membership of a learning community? Do existing models for describing learning in ‘communities of practice’ satisfactorily extend to the context of teacher learning through CMC?

This sub-category now needs to be qualified to ask: where learning in a COP may be adapted to be based in CMC, what capacity is there for the learning to be agentive and critical? Within the analysis a main way of identifying the impact of CMC on TPL will be therefore to examine how the participants, by engaging in ‘a way of talking’ through shared online writing, develop agentive and critical thinking about teaching, which involves an element of meta-level engagement with learning practices.

It is therefore important to explore debate about what is effective in bringing about learning within the community dimension of CMC. There are multiple theories of how community impacts on learning which centre on the notion of interaction. Rovai (2002) identifies seven factors affecting community for learning in CMC: transactional distance; social presence; social equality; small group activities; group facilitation; teaching style and learning stage, and community size. This focus on the social interactive features of the online environment emphasises the responsibility of practitioners to manage the environment to bring about optimum conditions for learning. Webb et al. (2007) claim that for productive interaction, professional communities need to be ‘outward looking’ and to ‘actively find out about practice’, building on ‘diversity’ to prevent them being ‘closed cultures’ (p. 181). A different focus on ‘cognitively productive’ online social interactions is favoured by McLoughlin and Luca (2000), who identify actions which denote social interactions to support learning in the verbs: offer, receive, exchange, explain and elaborate, share, give, challenge, monitor, engage, negotiate. These ways of conceptualising how community affects learning in online interaction favour actions and organisational features, but avoid focusing on the content of the interaction itself. To understand learning in these ways is to conflate social actions with conceptual change, and this is the difficulty of attending to

outward social actions as indicative of something which is multiple, complex and to do with attitudinal shifts which may be very subtle. Without a focus on meaning within shared online content, it is hard to discern whether 'interaction' is related to intellectual transformations.

Within the extremely wide-ranging perspectives on community in CMC, recent rationalisation has favoured a pragmatic approach to utilising what is relevant within an interdisciplinary approach to conceptualising community within particular contexts. It is argued by Preece and Maloney-Krichmar (2005, n.p.) that:

(no) particular theory or set of theories currently dominates research on online communities... As new and novel practices emerge within the online community environments, researchers broaden their perspectives as they seek to understand and explain online community dynamics and their effects on people, organizations and cultures.

This call to 'broaden perspectives' aptly describes how I see the need to adapt theories of online community to focus on their relevance to TPL. The only consensus about how far participation in online discussion can be said to bring about a state of 'community' is that each context must be considered individually, as huge inconsistencies exist between different groups of learners, and widely differing social, learning and organisational characteristics affect their learning practices (Fayard and DeSanctis, 2005). Applying concepts of community to online discussion in professional learning contexts however, whilst a well-established theoretical move, after Wenger (1998), must take account of the particular context and counter-arguments exist for such a transposition. Where this fails to happen, a breakdown in urgency, impetus and priority within practice in an online community is argued by Somekh and Pearson (2002) to be the result. In arguing that Wenger's model is a 'little technical' they posit that the necessary anthropological aspects of understanding learning within a community are neglected, because it cannot recreate for co-workers a sense of what it is like to 'be there'. This relates to the importance accorded to the narration of everyday work-related small-scale minutiae, both formal and informal, which is called upon in establishing a practice-focused learning community:

Wenger notes the inherent ambiguities in any group of individuals who bring their own unique histories and cultures to their shared work practices. To create shared

meanings and mutual empathy, the group needs its own stock of shared stories, experiences and jokes. (Somekh and Pearson, 2002, p. 499)

For this study, the analysis must address whether the teachers can be considered to recreate what it is to ‘be there’ through CMC in ways that could constitute a community with the capacity for professional learning. In other words, ‘community’ is an integral part of learning itself. It *is* social enactment of intellectual processes, not a separate condition from which learning proceeds. It is necessary to examine to what extent the teachers in the study possess a ‘shared stock’ of such socially-binding material which supports learning within the online environment. This would be to accept the counter-argument of Kress that electronic communication creates ‘presence’ as something which is temporal, not geographical (2003, p.12), but to acknowledge that indicators are needed by which to identify that the community is socially bound. By ‘temporal’ I do not interpret a need for synchronous presence to constitute community. Temporality is to do with teachers inhabiting a historical, social and political context which means that understandings of micro-level professional experiences can be shared. Thus a COP is not determined by the ‘place’ in which it exists – either a real workplace nor the virtual space of an electronic forum. “Researchers now consider the strength and nature of relationships between individuals to be a more useful basis for defining community than physical proximity” (Preece and Maloney-Krichmar, 2005, n.p.). Rovai (2002, p. 4), cites the work of Rheingold (1991) and Hill (1996) who suggest that a ‘sense of community is setting specific’ (*ibid.*), and should be viewed as ‘what people do together, rather than where or through what means they do them’. They argue that it is necessary to research in a variety of contexts to establish the possibilities of what might constitute different types of community. This also raises queries to be addressed in the methodology chapter on the need to interrogate an online COP in ways which take account of the context-specific setting, and the limitations of applying generic taxonomies to investigate the learning which occurs in such communities. The concept of community is not to be restricted to a particular form of structure or environment, but rather defines a collection of people with identities and practices who are brought together by social bonds which bring about the articulation of joint enterprise, mutual histories and shared repertoires within a work-related or professional domain. Rovai’s argument for the *quality of interaction* (2002, p. 5) online as an indicator of a community is vital in the context of this study, and the issue of quality

is implied by the criticisms of Somekh and Pearson, and relates to the intellectual dimensions of learning already identified as important for TPL. The challenge for the case is to develop methods to establish the elusive concept of ‘quality’ interaction in CMC, which is consistent with processes of participation and reification for professional learning.

2.3.2.6 Summary – the relevance of community for examining the impact of CMC on TPL

The concept of community offers a way of understanding professional learning where CMC can bring theoretical perspectives on what is socially binding between teachers. By emphasising the ways in which learning communities are established by ‘a way of talking’, the communicative function of community is stressed as being core to establishing the meaning of what people do, thus enabling them to take future actions. This concept of ‘a way of talking’ becomes fundamental to understanding TPL within a COP which exists within an electronic community. Ascribing meanings to aspects of practice, and negotiating their evolving significance, confers agentive possibilities on members of the community – this is what Wenger calls ‘ascribing thingness’, which renders things *real*. It requires communication with others who share a work-oriented interest in such meanings and who share practice-focused learning experiences. If it can be considered a community of practice in which teachers learn, the analysis must address what is ‘community’ about the online community. The literature on communities however is inconclusive and paradoxes exist. Previously it was established that ‘joint thinking’ and the literate processes of ‘filling with content’ are core to cognitive processes which contribute to a theoretical account of how CMC can impact on TPL. This section on TPL has extended the conceptualisation to address the significance of community for these socio-constructivist learning processes within an online teachers learning community.

Specifically, the issues raised for investigation into ‘joint thinking’ and ‘filling with content’ are:

1. What processes are socially binding in this context?
2. What ‘ways of talking’ indicate that meaning-making is present in the content of the teachers’ online texts?

3. What practices enable them to achieve participation and reification?
4. What features of teachers' 'specialized sensitivities', 'aesthetic sense', and 'refined perceptions' (Wenger, 1998, p. 81) about practice appear in their online writing?

These areas emphasise that there has to be inquiry into whether CMC carries out a *qualitative* critical function within the community of teachers. These issues inform the development of a methodology for textual analysis to examine the content of online discussion and the meanings teachers make of professional phenomena, which is addressed in 3.5.4. In this chapter, the next sections address the need for critical intellectual dimensions in TPL and how CMC relates to this, within the concept of agency.

2.3.3 Concepts of agency in TPL

2.3.3.1 The perceived need for agency

Agency is far more than the ability to take action, but is intrinsically linked to it. It is a concept which has informed the core of constructivist accounts of professional learning (Abbott, 1994; Watkins et al., 2002; MacGilchrist et al., 1997; Moore, 2004). One consequence of the performative agenda which is a feature of the globalised economic context for learning in the twenty-first century, has been the erosion of the notion of the intellectual teacher-self. Learning has been conceived of as a commodity in this context (Standish, 2002, 2007) and agency becomes compromised where teachers' professional learning is to a large extent driven by the pressure to achieve ever-improving performance from their pupils within a reductive 'economy of exchange and satisfaction' (Standish 2007, p. 2). Agency is conceptualised within this context as a counter capacity to think differently, to articulate the tensions between individual knowledge and experience and the social structures in which practice occurs. The increasing rates of social, cultural and economic change demand that teachers as learners are able to engage with and act within an ever-changing world, in order to prepare their pupils for this world within an ethical sense of professional purpose (Stoll, Fink and Earl, 2003; Ketelhut et al., 2006). Agency as a core element of TPL therefore focuses on the relationship between the inner-self in articulation with the external actor. The focus on the relationship between internalised intellectual concepts of teaching and external actions is complex and affects teachers' identities, and

agentive theories of TPL reject a view of practice as the acquisition of de-contextualised and de-personalised skills. In the United States, research has identified this as a ‘tension’ in the development of online professional development programmes for teachers, identified as ‘design for incremental learning versus design for transformation’ (Ketelhut et al., 2006, p. 238).

The agentive dimension of learning is essentially social and such a collegial perspective is core to agency as conceived of by Sachs (2003a, 2003b), drawing on Wenger, in her conceptualisation of teaching as an activist teaching profession. In this she acknowledges the dual aspect of professional identity as both individual and collegiate, but locates identities within a ‘fraternity’ rather than within individualised persons, and privileges the notion of identity as a collegiate framework over plural ‘identities’:

Teachers’ professional identities are rich and complex because they are produced in a rich and complex set of relations of practice (Wenger, 1998:162). This richness and complexity needs to be nurtured and developed in conditions where there is respect, mutuality and communication....It has to be negotiated, lived in, practised...Teacher identity stands at the core of the teaching profession. It provides a framework for teachers to construct their own ideas of ‘how to be’, ‘how to act’ and ‘how to understand’ their work and their place in society. Importantly, teacher identity is something that is neither fixed nor imposed; it is negotiated through experience and the sense that is made of experience (Sachs, 2003a, p. 135).

This socio-constructivist concept of teacher agency emphasises the role of collaboration in developing an agentive teacher identity. There is considerable difficulty in making such an agentive ‘cause’ an actuality in the English context however, where the majority of teachers experience little professional learning that is geared towards this concept of learning and CMC has not been explored in relation to this. The concept of the activist teacher is empty unless we ask ‘With what do you learn?’ Sachs fails to address this question, writing that we “just need to harness the various intellectual, social and political resources available to us” (2003a, p. 154) in order to bring about transformed professional learning, by which teachers have agency and are able proactively to plan and teach towards what she calls ‘socially responsible goals’. Harnessing these resources is acutely problematic where initiative overload and ever-increasing regulation has immobilised intellectual independence and practical variance. Herein lies the problem of a lack of attention to date to the micro-politics of community-based theories of professional learning. Her agentive

conceptualisation sounds somewhat at odds with the realities of teachers' everyday lives, where practice is immersed in struggles to achieve school effectiveness and normative concepts of improvement. Such a call requires professional learning instruments for articulating those aspects of practice which are rooted in individual histories and values which contribute to 'how to be' a teacher, and which bring this together with shared collaborative knowledge-making processes. Such learning instruments are as yet undeveloped on a wide scale (Dede, 2006; Pickering 2007), and the role of CMC in contributing to TPL has not yet been explored in these terms (Fisher et al., 2006):

There is very little fundamental research that investigates **how** teachers might learn with digital technologies. Rather, there seems to be a pervasive assumption that teachers **will** learn with digital technologies (p. 2).

Although Fisher et al. have a conviction that digital technologies will impact on teachers' agency "to act as knowledge builders, as collaborators and as reflexive practitioners" (p. 1), they admit that currently this remains a projected ideal. In the United States too, this vacuum exists: "we found ourselves dismayed by the dearth of empirical research into online teacher professional development" (Ketelhut et al., 2006, p.237).

This vacuum reflects the relative newness of CMC for teachers' learning communities, and the lack of transference of agentive theories of TPL to online contexts. Certainly, constructivist contexts for professional learning are core to the agentive dimension of TPL, but there is very little research into teachers' learning within the constructivist context of CMC. Current theories of professional learning do however, propose a range of factors by which agency is brought about, and there is considerable overlap between these factors and the constructivist properties of CMC. Each of these demand a level of meta-engagement with practice to develop critical thinking:

- Meta-learning
- Teacher narration
- Reflexivity.

All are forms of intellectual practice, and have their bases in constructivist accounts of learning.

2.3.3.2 Meta-learning

The case is situated in the MTeach course, which is premised on the notion of a ‘scholarship of teaching’ (Hutchings and Shulman, 1999), by which teachers’ learning is seen to be developed by critical engagement with practice – what Hutchings and Shulman call a ‘kind of going meta’ (p. 12). ‘Going meta’ has been applied to the learning of teachers from a variety of perspectives, which draw to greater or lesser extents on social interaction within a community of learners. Shulman’s contribution to meta-learning theory in TPL has been based on ‘case-making’, by which practitioners revisit experience by focusing on meaningful ‘chunks’ which serve as units for reflection in a form of teacher narration (see 2.3.3.3 below). Most importantly, he contributes the theoretical insight to meta-learning for teachers, “we don’t learn from experience; we learn by thinking about our experience” (1996, p. 208). Here, intellectual engagement with practice is the core of TPL, fusing theoretical and practical dimensions. Furlong (2000, p. 14) has stressed the importance of teachers developing what Hirst called ‘practical theories’ (1996), which “stand half way between the world of practice and the world of research, between disciplinary theory and other forms of knowledge”. The point is that while retaining complete practical currency, such theories are based on critically informed and rational reflection. As such, the ability to conceptualise learning and practice as interdependent is seen as crucial to teachers acting to bring about change in their practice.

In these terms, the notion of ‘reflection’ on practice has a troubled history – that is in relation to activist and intellectual TPL. The ‘reflective practitioner’ is now a commonplace term, but Furlong et al. have argued that teachers need to go beyond what they term ‘lay reflection’ (2000) if knowledge gained from experience is to have professional currency in the face of external and top-down definitions of knowledge about teaching and learning, and this cannot be achieved by remaining at a stage of ‘reflection-on-action’ (Schön, 1983, 1987). Kolb’s (1984) conceptualisation is based on the perceived need for teachers to revisit experience in systematic ways through a ‘cycle’ of reflection so that it may be interrogated in order to learn from one’s own practice. The concept of the lone practitioner undertaking introspective reflection is problematic however, as it can be self-referential and lack critical insights. In a move to a meta-learning perspective, Watkins’s model (2002)

develops the cyclical model ‘Do, Review, Learn, Apply’ from Kolb (1984) and includes an extra ‘cycle’ of reflection which promotes learning about learning and collaboration, and addresses the potential complexity of the process whereby the teacher learner becomes in fact a ‘meta-learner’, who is more versatile, learns with others, and is able to apply new learning across a range of contexts. These ideas incorporate a move from the individual to collegiate ways of learning and practising, and the need to review unarticulated or tacit professional knowledge. This warns against simplistic notions of ‘reflective’ online discussion as impacting on TPL and highlights the need to identify meaningful reflection.

Lingard et al.’s concept of ‘productive pedagogies’ (2003) establishes a further link between teachers who have rich understandings of what comprises their learning, and their classroom practice. Such teachers approach their work “as an intellectual activity” (p. 39) and demonstrate the impact of teacher learning on initiating change in classroom practice. TPL here is premised on the capacity for change which is ethically centred and can be realised by teachers as productive pedagogies, which “provide students with intellectual challenges, are connected to the world beyond the classroom, support students in their learning and actively engage with difference” (2003, p. 20). For Lingard et al., the Teachers’ Professional Learning Community is central to achieving agentive pedagogies, and there is a clear link between meta-level engagement and practice. This growing inquiry into meta-level learning for teachers is located within collaborative contexts, exemplified for example by: Haberman’s (2004) focus on community that “encourages teachers and staff to grow personally and professionally” (p. 52); Fielding et al.’s focus on ‘factors’ affecting the transfer of good practice within communities (2005); and Bolam et al.’s (2005) focus on how PLCs can be effectively created and sustained by teachers’ meta-level engagement with practice. It is in the growing community focus for teachers’ meta-learning that the potential for theoretical convergence with learning with CMC becomes strong.

2.3.3.2.1 Learning and CMC

Much early conceptual work on learning with CMC dealt with procedural aspects of learning, viewing it as a matter of interactivity rather than conceptual change or meta-level engagement with ideas. There have been shortfalls in many of the early theoretical

positions adopted in attempting to demonstrate 'learning' in CMC, based on a legacy of positivism in early inquiry into CMC, but the field now includes a number of alternative approaches which address meta-learning processes. These contrast with positivist paradigms, which developed a variety of ways of interrogating the text to make a claim for learning being identified, but these fall short of the critical, ethical and self-aware dimensions of meta-learning identified as being important for TPL.

The positivist legacy

The premise for positivist theories of learning with CMC is that there is a correspondence between thought and meaning in a consistent way in which textual features 'map' corresponding levels or development of thought. This has resulted in a proliferation of taxonomies of online discourse which classify constituent components of knowledge construction using linguistic, behavioural or socio-cultural descriptors. Three major forms can be discerned among these: firstly, through discourse analysis (e.g. Bradshaw et al., 2002; Garrison et al., 2001; Fahy, 2003) by which CMC is viewed as text which yields grammatical or linguistic markers which are deemed to be explicit indicators of the authors' development of thought within the discussion; secondly, at the macro-level of the discussion through mapping conceptual change (e.g. Turoff et al., 1999; Lapadat, 2000). Thirdly, in identifying dialogic genres as monologue, dialogue and conversation (Lamy and Goodfellow, 1999, p. 48) which is argued to support 'reflective conversation' (p. 1). The problem of reflection that is not critically focused has been outlined in the development of the notion of the 'reflective practitioner', above. Further to that, the online texts in this study do not conform to dialogic categorisations. They can be none or all of them at any time, depending on the hermeneutical perspective adopted. The traditional spoken and written dialogic genres do not transpose straightforwardly to online text. The case has developed a discriminating stance towards the notion of a text 'categorised' in this way, the surface features of which often appear to be what Lamy and Goodfellow would call 'monologue', but which in fact is created and affected through being with others online, even if the text does not actively address another person or invite response.

Each type of approach is premised on the idea that the development of concepts is deemed to be a matter of semantic organisation, at word, sentence or whole text level, in which certain textual features consistently indicate a particular state or act of thinking. Such

taxonomies however, may only tell how certain practices are occurring, and their frequency. As part of the development of the methodology (see Chapter 3, 3.5.1) I have identified the problems of theory-building based on these approaches (Pachler and Daly, 2005, 2006). Whilst they can provide useful information about the features of online interaction, their ability to conceptualise complex learning in TPL within CMC is limited.

Divergent and convergent thinking in CMC

More relevant to meta-learning perspectives in TPL is the exploration of divergent and convergent thinking which is supported by the asynchronous capability of CMC to support thinking over time. Garrison and Anderson argue that asynchronous discourse enhances the reflective process through processes of divergence and convergence, which are more effective than in face to face talk because the latter is “biased to a spontaneous and less reflective process” (2003, pp. 56-17). There are three key elements to this reflective process which extend its intellectual potential: creative thinking, “a divergent process focused on the early stages of critical thinking”; problem solving, “focused on convergent thinking that emphasises the latter phase of the critical thinking process”; intuition and insight, “important aspects of rational thought... they are important creative and subconscious inductive processes” (*ibid.* p. 57).

This affirmation of insight and intuition as valuable intellectual tools endorses what, in non-formal contexts, is referred to as tacit or experiential knowledge (Eraut, 1997). Such a conceptualisation denotes the specificity of professionally situated learning which is experiential, tacit, private, public, conceptual and practical, and defies hierarchical categorisations of learning. It offers a far richer perspective for meta-learning activities which are agentive in TPL than more positivist approaches to identifying conceptual development which has dominated research into CMC until quite recently.

Linear theories of divergence and convergence propose that the participants are moving along paths of progression towards deeper knowledge. Roschelle (1992) describes it as moving from democratic participation, to intellectual progress and gradual convergence; Harasim (1990) as moving from divergent thinking through intellectual progress towards convergent thinking, and convergence and divergence underpin Salmon’s progressive ‘five stage model’ of effective online learning (2000). Salmon’s ‘Five Stage Model’ (2000, pp.

25-37) for e-learning suggests that the foundations for learning are established in stages 1 and 2 of online course design, emphasising that social bonding is the preliminary to successful learning online. This case however moves away from the idea of community as a separate pre-condition of learning and rather looks at the notion of ‘quality’ interaction in terms of dual engagement in practice and community (Wenger, 1998) which constitutes learning about practice. The existence of a stable tutor group which frames the case may enhance shared memory-building between participants, but the focus is not on ‘stages’ of learning with CMC to achieve TPL. A linear focus does not reflect the processes of participation which Wenger outlines. Learning in a COP is not linear because community is not really a linear entity, but is constantly remade as part of the learning process. What is more relevant here is the theorisation of Koschmann (2003) who argues that learning in CMC is founded on ‘argumentation’ which takes a variety of forms of ‘constructive interaction’. Learning is *a way of engaging*. His ‘social conflict’ view posits that constructive interaction is generated by dialogue that promotes conflict: “learning ... occurs through a process of conceptual adaptation or accommodation in response to an intrusion or disruption” (ibid. p. 263). The importance of Koschmann for examining TPL is his focus on the agentive dimensions of CMC as ‘constructive interaction’. Agency appears as a main element in what he calls the ‘social practice’ perspective, which views learning not as a psychological phenomenon but as a social one “involving transformations in community membership and social identity” by which ‘distributed cognition’ is achieved (Koschmann, 2003, p. 264):

...participation in argumentation is the manifestation of active membership of a discourse community and there is a shift ‘from arguing to learn to learning to argue’, i.e. from viewing learning as a process of acquisition to one of participation.

This view of divergence and convergence as ‘social practice’ supports the view that participants are constructing a context in which it is possible to think in ways which are self-determining and which at its most developed can take “argumentation as a form of learning in its own right, conducted collaboratively and available to direct study” (ibid., p. 266). The essence of the social practice perspective on argumentation in CMC lies in Koschmann’s theory of ‘argumentation as joint inquiry’ (ibid. p. 265). The focus here is away from a content perspective on learning to a process perspective which focuses on

meta-learning and supports the development of independent and critical dispositions. This shares a conceptual view of CMC with Sachs's (2003a) definition of an activist teaching profession, in which observable TPL in the form of regulated skill development is rejected and processes of 'how to be', 'how to act' and 'how to understand' are markers of TPL. The knowledge about teaching is therefore not fixed. It is consistent with Lave and Wenger's (1991) argument that learning within practice is embedded in a 'way of talking' by which the participants learn how to become members of practice-focused learning communities. It also refines Wenger's concept of reification by which participants 'ascribe thingness' by processes of participation – they constitute the significance of professional phenomena. The case can here begin to establish coherence between theories of CMC, COPs and TPL. The potential of CMC as a critical practice makes it possible to investigate the online discussion for agentive qualities which are essential to TPL.

Lea (2000) also argues that it is possible for online discussion to allow participants to "use writing...as a way of 'thinking against' conventional academic discourses...[and] resist the normative function of academic discourse and therefore have the opportunity to challenge teacher[i.e. tutor]-centred hegemony" (ibid., p. 75). Here the focus is on the capacities of online discourse to foster learner counter-positions to external authority and tutor-centred knowledge. This is very much determined in her study however, by the learning aims of different online courses, and these differences result from "the relationship between the academic content and context of the course and the ways in which the technology is being used in a particular setting" (ibid). This challenges the assumption that writing online inherently fosters a more critical or reflective disposition in the participants. The relationship with the course philosophy and conceptualisation of knowledge is a crucial factor in the ways in which participants use the written messages to engage in critical reflection. She differentiates between courses where the academic content and the conference itself are 'conceptually separated' and those where they are 'not conceptually distinct' (ibid., pp. 77-78). Specificity is a core issue in why a case approach has been so important to exploring this instance of CMC for TPL. This suggests that the circumstances in which the teachers come to the MTeach, the course philosophy, and their motivations, will all contribute to the learning which develops.

2.3.3.3 Teacher narration

‘Talking about practice’, as well as being rooted in a theory of COPs, is consistent with theory of narrative as a way of ‘knowing’. Narrower views of narrative as primarily concerned with *form* stress that events, characters and ideas are organised according to certain stylistic conventions. Those based on *function* however, focus on narrative as involved in meaning-making processes and the production of identities, as defined by Polkinghorne (1988, p.1):

Narrative meaning is a cognitive process that organizes human experiences into temporarily meaningful episodes. Because this is a cognitive process, a mental operation, narrative meaning is not an ‘object’ available to direct observation. However, the individual stories and histories that emerge in the creation of human narratives are available for direct observation. Examples of narrative include...the everyday stories we use to explain our own and other’s actions.

Narrative in these function-oriented terms has informed the view of teacher narrative as arising from and constituting ‘critical episodes’ (Tripp, 1993) and having a vital role in enabling teachers to challenge orthodox, universal ‘truths’ which govern their practice (Clandinin and Connelly, 2000). Here, narrative *function* has been seen to contribute to teachers’ learning by the ways in which (professional) subjectivities are constructed through the ‘telling’ of experience from professional life. Teachers’ knowledge is constantly evolving from the stories they live out in the different ‘landscapes’ (Clandinin and Connelly, 1995) as they move between varying intrinsic and extrinsic agendas which constantly determine aspects of what it is they do as teachers. Herein lies convergence with Lave and Wenger’s (1991) concept of ‘talking within practice’ and Wenger’s (1998) ‘reification’ of practice-based phenomena through negotiating its meaning. Teacher narration is much more than recounting practice and needs to be distinguished as what Lave and Wenger (1991) describe as talking *within* practice. Talking within practice is not just teachers telling what they know – it has ‘specific functions’ which connect individual understanding with social engagement: “engaging, focusing, and shifting attention, bringing about co-ordination...on the one hand; and supporting communal forms of memory and reflection, as well as signalling membership, on the other” (ibid., p. 109). Such a conceptualisation of talking within a COP informs an understanding of teacher narration as intellectual engagement with practice.

What supports this intellectual aspect through ‘talking within practice’ is Tripp’s clarification that what makes a ‘critical incident’ for teacher learning is not the event itself, but rather “the way we look at a situation: a critical incident is a value judgement we make, and the basis of that judgement is the significance we attach to the meaning of the incident” (1993, p. 8). He stresses that the commonplace nature of incidents that become significant for teachers, such as Wenger’s stock of shared jokes, are significant in the forging of shared histories for learning in a COP. Clandinin and Connelly (2000) however, explicitly address counter-thinking in a way which has been found to be inconclusive with Wenger. They identify a clash between what we learn from individual, experiential narratives, and the overarching, orthodox version of universal truth, which was described by Lyotard (1984) as the ‘grand narrative’. Individual experiences of the world might run counter to the official ‘story’ of how things are. The grand narrative offers a story about the world in which one ‘common sense’ or overarching version of an issue or event establishes orthodox and unquestioned knowledge of those events and their significance and helps maintain the *status quo*. Narratives of experience offer challenges to accepted norms or assumptions. Clandinin and Connelly (2000) argue that it is in the friction between individual narratives and the ‘grand narrative’ that teachers learn and can reclaim agency. Learning is rooted in knowledge which is experienced as ‘first order’ ways of understanding the world (Laurillard, 2002) but this means that there is a need to find ways to enable teachers to articulate what they know in meaningful ways.

Eraut’s work (2000) further emphasises the need for methods of ‘enabling telling’ as a way of eliciting unarticulated practice-based knowledge in order to make it communicable to others. From this perspective, in its ‘enabling’ of telling, CMC is significant not because of its technological facilitation, but because it is a literate practice and through using language has a constitutive role in what is communicated by participants. An understanding of the literate aspects of the practice of CMC is vital to understanding how knowledge is constructed together, but also the social context which elicits tacit knowledge. Not only may ‘personal’ and ‘shared’ knowledge be hard to distinguish in TPL and CMC practices: the distinction between formal and non-formal learning is not straightforward either. This is significant for how classrooms, schools and electronic teacher forums can be viewed as social places, in which teacher learners interact. Individuals are constantly developing and

using unspoken or unconscious knowledge in their everyday communication with others in the development of professional knowledge, but Eraut's argument is that this tacit knowledge can be harnessed through what he calls 'the capability to tell' (ibid. p. 17). Teacher narrative as enabling this 'telling' brings narrative theory to workplace learning. It contributes to TPL as an intellectual activity by deriving from Bruner's (1985) concept of narrative as a 'mode of thought' which seeks explanations of the world, or ways of understanding, which are rooted in the contexts in which events occur. It accepts the principle that narrative truth is rooted in Bruner's concept of 'verisimilitude' or 'truth-likeness' rather than the absolute authenticity of events, and invokes an ongoing reflexive relationship with identifying the 'reality' which is exposed. This conceptualisation of 'talking within practice' as a narrative practice develops the agentive possibilities of interaction in a COP by addressing the specificity of TPL. It helps to sharpen the case focus and develop conceptual coherence from the various strands which have been brought together to contribute a theoretical rationale for the investigation.

Much theory of narrative in CMC focuses on narrative *form* rather than *function*. The underlying tendency is towards proposing narrative as a cohesive *form* in the electronic medium, which can replicate organising principles of conventional narrative genres (Luckin et al. 2001; Laurillard et al. 2000). Though properties contained within a narrative macro-structure of online discourse achieve cohesion at a surface level (e.g. through 'sign-posting' such as headings, structural clues, paragraphs) they do not indicate the particular relevance of CMC to narrative *function* in an agentive sense which has potential for TPL. What is significant about CMC is that narrative is not built around producing a persuasive and cohesive form which rhetorically presents the world of practice as coherent. For TPL, critical thinking is brought about by disruptive questions and interruptions to grand narratives which query the taken-for-granted coherence of practices as mechanistic or uncritical. This again is a feature under-explored in terms of contexts linking CMC to TPL. Robertson et al. (2005) point out that the use of new technologies for learning destabilises and decentres existing 'orderings' of classroom practices often leading to ruptures in the flow of learning practices. New related practices can have a disruptive effect on dominant orderings of thought and practice. They can bring their own regulatory practices as well as new pedagogic identities for teachers and learners. This highlights the view that engagement in electronic text-based discussion may exhibit '*the potential of disordering*'

which, according to Bernstein (1996, p. 128), is the inevitable effect of attempts to establish ‘a modality of order’ by which conceptual space may be governed. Teacher narrative as disruptive also has scope for ‘argumentation’ through Koschmann’s (2003) concept of ‘social practice’ in CMC – of meta-learning practice which develops counter-thinking. CMC can be seen to re-contextualise thinking and talking about practice for teachers from this perspective.

Thus, for teachers practising CMC in the MTeach forum, it is possible to identify a dual engagement with narrative. On the one hand, they engage with making narrative coherence within the macro-structure, i.e. the ability to make individual postings, based largely on accounts of professional practice, cohere and connect into some form of narrative is key. At the same time, the narrative function is based more on what can be recognised as Lave and Wenger’s (1991) concept of ‘decentering’ learning by focusing on what makes something ‘critical’. This emphasises that it is through collective learning that individuals can develop practitioner identities as an outcome of “the multiple relations through which persons define themselves in practice” (ibid., pp. 53-54). These notions of learning focus on the construction of agentive identities of practitioners through the interaction between the individual and the external world in which they act. The narrative in CMC does not proceed in a smoothly crafted form, but involves a constant negotiation by practitioners of meanings in what they do. Practice-based narratives are catalysts for critical review and reassessment of the assumed order or ‘grand narratives’ in which they are situated.

It is here that the importance of Rovai’s (2002) concept of ‘quality of interaction’ or Garrison and Anderson’s (2003) ‘qualitative shift’ in CMC is important in establishing its relevance to TPL. Fisher et al. (2006) criticise the adoption of technologies within simplistic concepts of knowledge transfer between individuals which “capture, copy and disseminate elements of ‘good practice’” (p. 39). CMC as a kind of information-exchange based on stories from the classroom falls far short of the professional learning practice which is conceptualised here. A crucial part of the learning process with CMC is in its ability to provoke critical engagement with narrative that goes beyond self-referential reflection, and affects the narrators’ identities and understandings of the purposes of their practice. This is a fundamental aspect of TPL, and is explored further in the final theme examined in this chapter, reflexivity.

2.3.3.4 Reflexivity

The full complexity of the challenge to achieve agency in TPL is addressed in Moore's (2004) conceptualisation of the historicised teacher-learner. He locates agency in the capacity for reflexivity in which there is considerable scope for theoretical convergence with the process identified as 'context-making' in CMC.

Processes by which an individual can be reflexive are bound up with the contexts in which they are learning – autobiographical, social, historical, political. Agency is a key element in Moore's analysis of dominant 'discourses' of teaching and he emphasises that these discourses should themselves be the focus of teacher learning – a call for a form of meta-level awareness of how teachers learn to be teachers, and how what they can do is conditioned by how they are constructed as teachers by these discourses. Moore's advocating of reflexivity requires teachers to trust themselves as learners and *take charge*:

...reflexivity provides one avenue for teachers to take charge of their own learning and development on their own terms, in ways that specifically and systematically include the idiosyncratic, contingent aspects that are so crucial to their work (and in their understanding of their work) (2004, p. 168-9).

Moore suggests that the potential for agency lies where teachers engage in an alternative way of constructing the professional self, by adopting the 'reflexive turn' (p. 141), which develops the discourse of the 'reflective practitioner' away from the self-referring and inward-looking solo-performative connotations it bears. The 'reflexive turn' emphasises that reflexive practice goes beyond 'reflection' and should be "authentically and constructively critical...challenging rather than confirmatory" (ibid. p. 142) and is rooted in the construction of continually evolving teacher identities, which are based on understanding the teacher as a person and practitioner who is continually developing, based on their history as a social and intellectual being. It thus builds on notions of the self as comprised of evolving identities, and ways of becoming reflexive are based on teachers' narrating, historicising, and critically deconstructing how they act in order to understand themselves and their practice within the social and political conditions which bear on those actions.

It is with this concept of agency as constructive of reflexive teacher identity, that online textual representations of ‘self’ through teacher narration become relevant. Representations of self form part of the complex process of self-disclosure (Moran and Hawisher, 1998), by which the learning dynamic of the online community is steered by the participants who take charge of their online learner identities. Blake (2000, p. 194) comments on the increased power over self-disclosure in relation to online contexts and relates this directly to learning, in so far as it is understood as personal transformation, with the learner not just emerging as a ‘better informed’ or ‘more skilful’ person, but also as a ‘different’ person (*ibid.*). The point is not to conflate what gets posted online at an individual level with the ‘person’/persona who writes it. Narratives which declare some process of individual growth or empowerment may not be trustworthy, and may be rhetorical. The agentive dimension lies not in the belief that what a participant says is actually *so*. It lies in the collective sense of historicised professional histories coming together and altering what things mean. The veracity of what one person says is, in this light, neither here nor there. It assumes that critical joint thinking is an agentive practice, and the ‘whole’ of the community’s discussion is what is agentive as a phenomenon. It is constituted by multiple independent choices about how to exert presence and make meanings. Individuals become the *makers* of the conditions which enable them to learn – the context, recalling Edwards and Mercer’s definition of this as a ‘mental phenomenon’.

The concept of context-making in CMC has an essential relevance to processes by which teacher participants may develop reflexivity. Context-making is a theory derived from the ethnographic study of communities (Hymes, 1994). It is the means by which participants in a community establish their competence as members of particular communities, and proposes that individuals are *makers* of the context in which the community exists. ‘Context’ becomes a malleable concept, whether it is applied to individuals communicating in a physical space or online. The implication of viewing community as ‘what people do together’ (Jones, 2002) moves away from material and spatial considerations of what is socially binding. Jones suggests that the context in which written online interaction takes place is made up of the various ‘models’ that people build up in their minds (and in their interaction) of the situation. They construct knowledge – or ‘models’ and use these models

to make predictions about the kinds of behaviours which will show them to be ‘competent’ members of particular communities. ‘Context’ is therefore not something communication ‘exists in’, but is

something that interactants create as they go along...context is a function of interaction and negotiation, bound up with communicative intentions and purposes and dependent on the ways people enact *social presence* and become aware of and interpret the enactment of *social presence* by others (Jones, 2002, pp. 4-5).

Such a perspective affords a high degree of agency to the participants, whose interaction can shape what things mean and bring into being new conceptions of the self as an individual – and teacher - in relation to others within the online community. Blommaert et al. (2004) assert that the ‘normalcy’ of textual literacy defines what it is to be ‘normal members of our cultures’ and this has particular application to being readers and writers of electronic text written within a teachers’ learning community where it establishes mutuality, or what may be termed ‘moral purpose’ (Fullan, 2001) among fellow participants. Sharples (2007) draws on Cole’s distinction (1996) between ‘that which surrounds us’ and ‘that which weaves us together’ in his assertion of the agentive capacities of context-creation within electronic discourse communities: “Context is continually created by ‘minds in motion’ within distributed learning systems” (n.p.). By this he accords a high level of agentive capacity to minds which interact to determine the meaning of things and the outcomes for the participants. Within CMC, “context is a dynamic and historical process constructed through interaction between people, technology, objects and activities within a pervasive medium to enable appropriate action” (Sharples, 2007, n.p.) – i.e. learning. Such a concept of dynamic and historical process is core to Moore’s concept of reflexivity in TPL as an agentive process. This is because learners with CMC thus take an active part in the development of processes by which they come ‘to know’, which brings a fundamentally different perspective to what teachers can do to help shape their learning through online participation.

Grunberg and Armellini (2004; 2005) found that online communication has the potential to support the development of ‘collegiality’ in school teachers via the practice of ‘social exchange’, but that this does not necessarily support reflexive learning practices. Frequently, ‘sharing’ is limited to the exchange of resources, rather than explicit reflection

on practice and critical debate. Grunberg and Armellini (2004) point out a serious impediment to reflexive learning for TPL:

Most solicited contributions (i.e. replies to requests) were sent privately... teachers decided to reply privately to virtually all requests, even to those sent publicly. Thus, *while man exchange processes were initiated in public, they subsequently moved to the private realm...* This pattern of 'privatisation' of professional exchanges (i.e. public requests eliciting private answers) may diminish the potential of electronic mail for supporting professional development (p. 603).

Essentially, communication was found to lack discussion of pedagogy or theoretically informed beliefs about learning and teaching (Grunberg and Armellini, 2005).

McConnell's (2006; 2000) work on co-operative and collaborative learning shifts the focus over time from examining learning in online groups to interest in the online learner as the 'postmodern self' within an online collaborative context (2006, p. 2). He focuses on the values of learners and e-practitioners, which are fostered by working together in communities via collaborative learning processes. He acknowledges that we still know very little about 'the realities' of online communities of practice in terms of how they build values. Although he is chiefly concerned with HE teachers, he asks the question which is relevant to school teachers in online contexts – 'what do we mean by learning?' in a context where there are no specific learning outcomes. He argues that professionals 'negotiate identity and knowledge' (2006, p. 163) as features of becoming a community, and that researchers should "move from looking at the group as the object of analysis, to looking at the individual within the social environment of the group" (ibid.). He points to the 'quality of relations' which affect online learning, and it is a shift in perspective away from a concern with discourse and towards social practice.

Such a focus on the relationship between the individual and the group is core to this study, and involves a social practice perspective. Jones (2008) has suggested that this offers a theoretical lens that allows researchers to examine networked learning:

Social practice points to learning as an activity...to be understood not only in terms of objectives and outcomes but also as a set of located practices in which contexts

for action are mutually constituted by the different participants and in relation to the discernable material conditions in which the field of practice is constituted. Learning in this sense takes place over time, is located in spaces both material (including the virtual) and social and forms part of a wider array of social practices (p. 619).

Santos and Hammond (2006) found that, even where it is possible to claim that ‘community’ exists within an online tutor group, “to find evidence of learning taking place as a result of the interactions...not surprisingly turned out to be more difficult” (p. 10). A way of conceptualising ‘learning’ within an online community is offered by the concept of ‘weak ties’, which focuses on what may be present where little observable interaction takes place. Jones et al. (2008) root their work on ‘weak ties’ in network theory:

Network theory would suggest that the strong notions of community contained in CoPs might ignore the importance of the ‘strength of weak ties’... The educational focus on strong links and the emphasis on community may have downplayed the many necessary but weak connections that make networks so powerful (p. 92).

They suggest the importance of ‘weak ties’ which enable learning within relatively ‘inactive’ online communities of professionals, drawing on Bakhtinian concept of all ‘utterances’ as essentially dialogic:

As Bakhtin states, ‘Sooner or later what is heard and actively understood will find its response in the subsequent speech or behaviour of the listener’ (Bakhtin 1986, p. 69)...For Bakhtin, even a monological utterance is full of dialogic overtones. As he explains, ‘In reality, and we repeat this, any utterance, in addition to its own theme, always responds (in the broad sense of the word) in one form or another to others’ utterances that precede it’ (p. 94). For the purposes of our argument, this idea is important since it relates to our discussion of latent links and suggests that the process of reading a post might be seen as dialogical, or at minimum, to have dialogical overtones. If a member of a forum reads a posting, and this then has an impact on their subsequent activity, they can be seen as having entered into a learning dialogue even if they do not formally respond to the posting.

This is significant in terms of understanding Koschmann’s (2003) concept of learning as the appropriation of sociogenic resources within a community of learners, which may not require extensive iterative dialogue.

2.3.3.5 Summary – the relevance of agency for examining the impact of CMC on TPL

Agency, in its capacity for self-determination, rejects the essentialising of what a teacher is taken to be and what they can learn, because it requires the teaching profession to constitute *itself* and teachers *themselves*. The lack of professional learning instruments to achieve this has not been sufficiently addressed in the literature advocating ‘activist’ or learning-centred professionalism. In the field of TPL there is however, a core emphasis on meta-learning, and the learning potential of what teachers tell about their practice within collaborative contexts. CMC in relation to this may contribute to these processes, through how participants are enabled to inhabit agentive ways of thinking, to see themselves differently and become reflexive, in a way that rehearses altered dispositions and thus is part of the process of *becoming* a different person.

Agency thus focuses on a process view of learning, seen by Koschmann as a way of engaging, not as a product but as a practice. The intellectual dimensions are central, and involve the teacher in taking charge of their thinking and the processes which are deemed to cultivate it. Reflexivity is the learning goal for TPL and is closely related to context-making practices in CMC. These help engender counter-thinking through the narrative functions of CMC as potentially disruptive, and as a vehicle and constituent of teacher narration which challenges prevailing ‘truth’ about professional practice. As such, reflexive processes are non-confirmatory.

The concept of context-making in CMC is important to how it can support agentive elements of TPL. It grants a high degree of agency to participants and refers to both individual and social conceptions held by the community of what it is they do and how they learn. Key to the agentive dimension of the context-making process is the adoption of roles in each other’s learning, where inter-participant exchange and social presence impacts on individual and collective learning and control over knowledge-making processes. Disruption or questioning of orthodoxies is a learning property of CMC and reinforces that collaboration should not be mistaken for consensus in TPL, nor in identifying learning in CMC.

Therefore, an examination of the concept of agency has developed further refinements to a theoretically coherent view of CMC and TPL. The following emerge as these refinements:

1. ‘joint thinking’ may be disruptive of orthodoxies and non-confirmatory of individuals’ beliefs and dispositions;
2. ‘filling with content’ requires teachers to critically interpret their own and their peers’ ‘telling’ about practice; and
3. ‘community’ does not imply consensual meanings, or social practices which amount to ‘interaction’ *per se*, but is an intellectual practice in itself which involves context-making, by which teachers can take charge of their own learning within a dynamic textual and social process.

2.4 Summary of Chapter 2

This summary brings together the theoretical perspectives explored in the chapter to establish a coherent conceptual approach to investigating the impact of CMC on TPL. This approach is needed for the development of an appropriate methodology and analytical framework.

Research which explicitly addresses the relationship between CMC and TPL is rather limited. Concepts from both fields however share socio-constructivist learning perspectives which direct the focus to the development of shared understanding and joint endeavour within social contexts, and away from notions of ‘mastery’ or ‘apprenticeship’ which centre on the notion of the individual learner. Theories of work-based knowledge and professional teacher learning suggest a lack of professional learning instruments by which non-formal or tacit knowledge gleaned from practice can be articulated and projected to become part of a shared history, and become the subject of processes of reification. Theoretical perspectives on professional learning focus on developing teachers as potential change-agents possessing altered collegiate ideas of what it is to ‘be’ a teacher. Agentive concepts exist of teachers as learners with capacities for professional action, but these concepts lack an operational rationale by which teachers can be enabled to learn in critically informed ways. Constructivist practices for teacher learning have, until very recently, been at the level of

national forums or have a largely macro-level impact, and neglect the personal transformational potentials of interpersonal learning through new forms of communication which are based on negotiating meaning. Wenger's core argument is that it is negotiation that enables people to act, "Practice does not exist in the abstract. It exists because people are engaged in actions whose meanings they negotiate with one another" (Wenger, 1998, p. 73). It is the critical negotiation of meaning that is key to TPL, and this highlights the need to identify what conceptual and reflexive activity occurs within CMC.

Theories of agentive dimensions of CMC suggest it can support TPL, through the focus on: collaborative learning; sharing and making histories together which offer the foundation for critical examination; and its support of reflexive processes, by being rooted in a historicised learning community with ethical purposes. All these rest on its capacity to enable 'telling'. A theoretical coherence emerges, based in accounts of learning in community and work-based contexts around the concept of learning as 'a way of talking' which can be supported by CMC. This is based on the prevalence of theoretical emphases on the relationship between talking and building practitioner knowledge in ways which foster agentive professional identities. This ranges from Wenger's emphasis (1998) on finding 'a way of talking' about engagement in experience, to Eraut's assertion (2000) that learners must be 'enabled to tell' what they know from experience, to Lave and Wenger's claim (1991) that learning in the workplace is based on 'talking within practice'. An investigation of the impact of CMC on TPL that is based on 'telling' must be focused around evidence found in the telling of:

- i. joint thinking
- ii. meaning-making through textual exchange
- iii. community dimensions which indicate context-making processes
- iv. agentive and critical ways of thinking and the development of professional identities.

The development of appropriate ways to investigate evidence of these is addressed in the methodology chapter.

CHAPTER 3: METHODOLOGY

3.1 INTRODUCTION

The chapter explores the challenges of developing a methodology which has had to be both adaptable and coherent to explore TPL within CMC from different perspectives within a case approach. It explains why I have borrowed from the fields of sociometry, social science and textual hermeneutics and how these have contributed to the case. The chapter explores four methodological issues:

- a. the development of the case study approach;
- b. the mapping of online interaction to represent what it ‘looks like’ as a preliminary to textual analysis;
- c. the role of interviews with the teachers as makers of texts; and
- d. methods for analysing the content of online discussion in detail.

The chapter includes an analysis of a pilot to develop methods for the analysis of the content of texts in online discussion, which has been the main methodological approach in examining the teachers’ online writing. The qualitative content analysis (QCA) model, adapted from Garrison and Anderson (2003), has been essential in establishing a method of analysing qualitatively the conceptual content of online texts. A pilot interview and the development of methods to ‘map’ the discussions is also included.

The development of methodology reflects what Snyder has called the ‘critical borrowing’ that is necessary to develop research within the ‘chameleon field’ (1998, p. xxv) of learning with technologies. This work is located within the context Laurillard (2002) describes as the ‘second wave’ of research into the impact of technology on learning, which is characterised by the need to find appropriate methods which address the specificities of new learning practices within particular contexts. Snyder suggests that research in this area should ‘grow out of the problems and questions in the field’ (1998, p. xxv) and these have been examined regarding TPL within CMC in Chapter 2. ‘Growth’ is now presented within this bounded instance of wider contemporary problems and questions, since CMC and TPL do not share established disciplinary processes which are deemed to cultivate and research

knowledge. As it progressed, the methodology demanded adaptation and creativity. Laurillard warns against trying to describe ‘with completeness’ (2002, p. 63) the learning process, and the focus on textuality as core to joint thinking has guided the bounds of the investigation into the learning of teachers with CMC. The methodological issues are brought together to help build a picture of their learning, based on the need to get close to what happens within an elusive constructivist practice. The methodology developed from the notion that the teachers’ online messages act as a ‘way of talking within practice’ and that they can learn from each other’s representations of practice within these messages. The principle of this constructivist practice as agentive, rejects the tutor as a key to learning through expository practice, and seeks ways to avoid the power relations embedded in tutor interventions in the discussions. The data focused on what the teachers themselves did, said and wrote as members of an online community of practice. I am mindful that what they wrote online as practitioners is a representation of reality, and that the relationship between textual representation and professional practice must be problematised, just as any text can only be a version of what ‘is’, subject to the interpretations of the writers and readers of that text. As the researcher my role in the case was to construct a coherent narrative by which I make explicit the relationship between the interpretive process and the way in which ‘reality’ is presented in a qualitative case study. This is discussed in detail as part of the stance which develops the case approach.

3.2 THE CASE APPROACH

The research perspective is based in *naturalistic* research, (Frey, 1994). It aims to increase understanding of phenomena which are currently inadequately understood, and in which Frey’s criteria for naturalistic research are a close fit – i.e. realities are multiple and constructed, and the researcher is inseparable from what is known. In constructing the case, I impose an order on its development which in many ways reflects a ‘macro-narrative’. By this, the constituent parts are brought together and each must be seen in relation the whole in order for their full significance to emerge, and vice versa. The macro-narrative imposes an order and coherence on what is a set of diverse but related research activities. In being self-aware of the constructedness of the case, I use a narrative framework to relate the thinking and actions I took to develop the investigation. Thus the data collection has a narrative sequence which looks ‘logical’ and chronological over the duration of the study:

- 2003 Mapping online textual activity of the case teachers
- 2004 Interviewing the teacher participants
- 2005 Piloting a model for the qualitative analysis of online texts
- 2006 Conducting qualitative content analysis

The methods within this ‘chronology’ are based on exploring three key perspectives on the case. As a preliminary stage in the research, I wanted to understand the ways the online discussions contain messages which connect with each other. I developed a way of ‘mapping’ the discussions which would show how the content of the messages is *related*. Thus I would have an overview or macro-perspective of the discussion as a social and literate practice. For this I drew on sociometry, which uses diagrams to show ‘relatedness’. Then I interviewed the participants to gain an understanding of their perspectives on writing together online to learn, and gained an alternative social and psychological perspective on the textual interaction which I had mapped. Finally, I conducted Qualitative Content Analysis (QCA) to analyse in detail the content of the texts themselves for TPL, examining categories which reveal conceptual content in terms of social and cognitive presence, according to the ‘community of inquiry’ model from Garrison and Anderson (2003).

This sequence of investigation however, is in fact the outward organisation of internal struggles within the case to develop a methodology which is coherent with the theoretical positions I hold as researcher. Throughout the account, I have needed to disrupt the coherence and chronology by juxtaposing with accounts of the difficulties, especially in relation to the development of the method for analysing the online discussions to identify TPL, which involved a considerable shift in my theoretical position towards the use of categories in understanding the texts.

The case study is a fundamental form of naturalistic research, and the research was conducted through a case study of my online tutor group which consisted of fifteen teachers who started the MTeach in September 2002. The ‘type’ of case study this is, is difficult to categorise. It is, in one sense, what Stake (1995) calls ‘intrinsic’ (p. 3) in that I am studying a case in which I am fully involved by being a tutor and where I have a stake in any

findings which are highly situated. It is also however, what he calls an ‘instrumental case study’ (*ibid.*), a way of understanding something other than itself, because I develop the case in order to investigate a question about teachers’ learning which exists outside of the case. Thus both the intrinsic aspect of the case itself (the interactive practice of CMC among this group of teachers) and the issues which it enables to be explored (the impact of CMC on professional learning) are part of the story. The distinction of a ‘type’ is in fact not helpful in developing the case, nor in establishing the methods. It is more important that, by using a ‘case’ approach, I am invoking a qualitative research paradigm and the vehicle for what Flyvbjerg calls “a nuanced view of reality” (2006, p. 223) which can support the production of context-dependent knowledge. Schostak (2002) highlights the potential of a ‘case’ for examining complicated social and psychological phenomena which do not necessarily show what he calls “any internal unity of consistency” (p. 17). The case both frames the investigative process and emerges from it. It is therefore “produced from the repertoire of codes through which individuals make sense of their lives, by which interactions are managed” (*ibid.*). The case is therefore a vehicle which can capture the process of myself as the researcher seeking to understand, at the same time it establishes the research framework.

The *complexity* of the phenomenon is central to this case approach and the development of appropriate methods. Schostak argues that the complexity of a social phenomenon can be investigated by a case approach, which builds a picture of what is happening. His definition (2002, pp. 18-19) of a case approach foregrounds qualitative research as a means by which we can explore the ways a “‘self’ and its ‘world’ are constituted and coordinated” within a context. This is to seek to understand the relationship between internal experiences or cognition and external ways of acting in the world – in this case by understanding TPL which is constituted with CMC. The concept of ‘talking within practice’ which brings a theoretical coherence to TPL within CMC, is premised on the inter-relationship between internal transformations and social engagement. TPL has been viewed as an *intellectual* activity which bridges the private and the public, the individual and the social. At the same time, the iterative relationship between myself as the researcher and the research is the means by which a ‘complex’ may be understood, “The project is like a conversation framed by the questions the researcher directs to the self, the other and the materiality of existence” (*ibid.*).

This ongoing iterative relationship has been central to the development of appropriate investigative techniques, by which I sought ways to map the online discussions, analyse their content and ask the participants about their experiences of them. Schostak is clear that a case study attracts particular qualitative approaches: “[Cases] are not ‘self-contained spheres’; they should not be drawn into statistical discourse so the samples become ‘homogenous groups’, and should not be subject to ‘relentless abstraction’ of grounded theory” (p. 22). This is apt to the focus of this research. ‘Relentless abstraction’ is not helpful – the point is to gain understanding of the situatedness of the teachers’ learning and the conceptualisation which emerges must be constantly located in the specificities of the context.

Whilst the qualitative imperative was important, and is the main driver for my approach to the research, I have found it helpful to explore the potential of content analysis, which originated in computer-aided textual analysis, and an approach to mapping online textual activity by a form of ‘sociogram’ which is based in mathematical ‘graph theory’. These approaches have been adapted considerably to help investigate the qualitative perspective on TPL in the case, and they prompted the revision of previously held convictions about the nature of the knowledge I am seeking to develop, and hence the nature of the research. The process has helped me develop insights I would not otherwise have had into ‘what is going on’ in the online writing and revise purist beliefs about the nature of qualitative research. This has been part of the adjustment necessary in bringing an understanding of ‘critical borrowing’ to a case approach.

‘Case-making’ (Shulman, 1996) offers a further rationale for a case approach to the research. Shulman’s emphasis on establishing boundaries around what will constitute a case in a professional learning context helped to identify it as something which can be segmented into what he terms ‘chunks’ from the continuous flow of experience in order to understand and learn from it. I have ‘segmented’ experiences, by selecting for analysis the online messages which explicitly address the learning tasks which were set, and rejecting those messages which carry purely administrative or social and community building functions, even though these may be relevant to a study of community or CMC per se. A crucial aspect of Shulman’s ‘case-making’ approach however was not adopted. He builds

cases around moments of crisis or interruption, and takes ‘what gets said’ by participants as ‘what *is*’, which would be to adopt an entirely different epistemological stance to the texts which form a large part of the data. This research sits one epistemological stage further back – it is about the interpretation of (what constitutes) what was said or written, and the teachers’ narration of ordinary minutia is as valuable as dramatic events.

3.2.1 The research stance

Thus in response to Schostak’s question as to whether a case study is a perspective or a methodology (2002, p. 63) this case study is more defined by my perspective as the researcher than methodological frameworks. The case does not imply a methodology, but allows for the iterative development of very different methods, considerably adapted from their origins in mathematical inquiry into social relations and computer-assisted textual analysis. They have been developed by my need to look at the data from different perspectives, and dissatisfaction with easily transferable methods which could not examine closely what is specific to this context.

Locating myself as the researcher immediately disturbed the taken-for-granted flow of relations between myself as the tutor with my students. My role as tutor brought an ethnographic element to the work, sharing to an extent the conditions which have generated personal and social interactions and changes within the community. This case therefore has elements of ethnography, in that the research stance is a ‘way of being in the world’ (Geertz, 1983, p. 155) and because the research took place within a ‘cultural frame’ shared by myself as the tutor with my students. Geertz’s model of interpretive explanation “is a form of explanation which ‘trains its attention on what ...utterances, events...all the usual objects of social scientific interest, mean to those whose...actions, customs, and so on they are’ (ibid.). Ethnographic-type data in the case could be described as ‘opportunistically collected’ (ibid. p. 157) in that the postings to the online forum were going to happen anyway, and were naturally occurring within the social group being studied, of which I was a part. The ethnographic element is therefore most aptly described as research conducted from an ‘insider perspective’. I was not fully immersed in the socio-cultural world of the teachers, but was party to the bounded context of their participation in the MTeach course. I also have a partial interest in the outcomes of the research – as a practitioner, I have

engaged with “questioning, making sense of and connecting one’s day-to-day work to the work of others and to larger social, historical, cultural and political contexts” (Webb et al., 2007, p. 174). Webb et al. base such an approach on Cochran-Smith’s concept of research undertaken by practitioners as ‘inquiry as stance’:

Central to the idea of inquiry as stance is the relationship between the knower and the knowledge...the practitioner is both user and creator of knowledge, which is always regarded as generative and tentative, to be questioned, challenged, connected, tried out, revised, reshaped, and held problematic. (Cochran-Smith, 2003, p. 21, cited in Webb et al., 2007, p. 174)

These features aptly describe the ‘trying out’ of knowledge within this research context, and the focus on ‘critical borrowing’. As an ‘insider’, the research approach has also provided me with ease of access to online data and frank interview exchanges. I am aware that the teachers were positioned as my students, and the desire to mediate their experiences in particular ways was conditioned by my tutor role and the power relations at play. Within this complex, the interactions were being constantly ‘managed’ (Schostak, 2002) – the research interaction is one of them, and the interviews were a part of their experience which they managed, as was their awareness that I read the online discussion as a tutor, researcher, and future assessor. This, rather than invalidating the data, is part of the way it is ‘recontextualised’ (Brown and Dowling, 1998, p. 8), by which the “objectification of your activities is always a different experience from your experience of those activities themselves”. This happens explicitly where the teachers oscillated between expressing views online and then ‘confessing’ to different ones in interview. Tensions in inter-personal relationships with their online peers were expressed in research interviews which would not emerge otherwise, in response to my questions about the online discussion. This was an ethical quandary concerning how or whether I should act upon that knowledge, in terms of my subsequent tutoring of the group and organisation of social relationships for learning, based on insights into their inter-personal relationships than I would not ordinarily have accessed as a tutor. The research has allowed me to transgress the normal boundaries of tutor knowledge of the group, between that available to me as insider/outsider, trustworthy/not trustworthy (Schostak, 2002) which has occasionally informed my conduct as a tutor, and indicates an ethnographic and action research dimension. Rather than trying to impose artificial boundaries around the ‘type’ of research this is though, the frame of a

case study allows me to draw on elements of each, and identify the limits of the data collection and of the methods employed to understand this particular complex.

3.2.2 Ethics

Ethical dimensions are grounded in the theoretical stance towards online writing and ‘persons’ adopted by the case. The conflation of the electronic author with his or her textual output has been described as ‘unsupportable’ (Bassett and O’Riordan, 2002; Borland, 1991) from the viewpoint of writing online as ‘a form of cultural production’. The research does not seek to examine the teachers themselves as individual psychological and social beings, but rather to examine the phenomenon of teacher learning which emerges from the practice of CMC. The text itself is an unreliable indicator of what an individual teacher knows or ‘is’ in an absolute sense, since it is subject to the author’s increased power over self-disclosure in relation to online contexts (Blake, 2000) and the reader’s role as constructor of meaning in the interpretive process (Freund, 1987; Eagleton, 1983, 2003; Kress, 2003). This has informed my understanding of what it is to work with texts, as well as people, ‘responsibly’ (Bassett and O’Riordan, 2002, citing Borland, 1991, p. 71).

The ethical aspects of the research have been conducted within what Capurro and Pingel (2002) call an ‘ethics of care’, undertaken within an understanding of the ‘social responsibility’ (Anderson and Kanuka, 2003) of those who research within online communities. The research has been developed in adherence to the Revised Ethical Guidelines provided by the British Educational Research Association (2004). The need for informed consent was a priority. Consent was sought at the first face to face meeting following the first discussion, so that participants would have knowledge of what the forum was like, and what the discursive process entailed. This was important as only two of the group had been involved in any kind of online learning before, and could not know what the discussions would be like. A full explanation of the research was given at the face to face meeting, with the opportunity for the group to ask questions. All the participants gave consent, and they were invited to contact me by email afterwards to discuss any issues or withdraw consent. No teacher chose to do this. Anonymity has been maintained by the use of pseudonyms throughout.

3.2.3 The sample of case study participants

As an ‘intrinsic’ case study in one sense, the sample was structured from the outset by the context. The tutor group of fifteen teachers formed the purposive sample for the case. My qualitative interests in investigating learning within a community context needed a sample group which already existed. Bogdan and Biklen (1992) claim that purposive sampling is helpful because subjects are included “because they are believed to facilitate the expansion of the developing theory”, their opinions shaping the development of the research and supporting the conclusion (*ibid.*, p. 71). A purposive approach meant I selected my tutor group, and through being their tutor, I hoped I could enable them to talk freely with me in interviews about their perspectives on their learning within the online discussions.

The MTeach tutor group was formed from ten teachers employed by a London Local Education Authority (LEA) (comprising primary, secondary and Special School teachers), and five from one secondary school in Essex. The group brought together two sets of teachers working in very different contexts, and was cross-phase and cross-curricular. The LEA teachers worked in the London urban context, and were subject to shared LEA priorities for In-service Training and target-setting for example. The secondary school teachers worked in a Training School with higher academic achievement than most of the LEA schools, and served a much less diverse community. All the teachers were offered financial support towards the cost of their studies by their LEA or school. The fifteen participants started the core MTeach module ‘Research and Professional Practice’ (RPP) in September 2002 and provided the data collected in the first three online discussions for module 1. One participant deferred the following year so fourteen participants were available from which to select the interview sample. In order to organise the recording of data collection, each member of the tutor group was given a number, Participant 1-15 (P1-15), when the first online discussion was completed.

Teacher	Phase	Gender	LEA/School	Interview Sample	Participant
Tarsim	Special/Primary	F	LEA		P1
Dave	Secondary/English	M	School	Yes	P2
Jane	Special/Primary	F	LEA	Yes	P3
Annie	Primary	F	LEA	Deferred	P4
Mary	Secondary/ICT	F	School	Yes	P5

Oscar	Secondary/History	M	LEA	Yes (Pilot)	P6
Mike	Secondary/Geography	M	School		P7
Greg	Primary	M	LEA	Yes	P8
Kim Li	Primary	F	LEA	Yes	P9
Linda	Secondary/RE	F	School		P10
Jenny	Primary	F	LEA	Yes	P11
Joyce	Secondary/English	F	LEA		P12
Sally	Primary	F	LEA		P13
Neil	Secondary/MFL	M	School	Yes	P14
Angelique	Primary	F	LEA		P15

Table 3.1 The case sample Master of Teaching tutor group

3.3 MAPPING THE ONLINE TEXTS

The first stage of data collection involved mapping the textual activity of the teachers. It was done to develop an overview of the online practice, in a way which established the connections between online texts explicitly. I shared the maps with colleagues in two research seminars and found that they could express a ‘view’ of what was going on in my online tutor group. The audiences included those with no idea of what an online discussion ‘looks like’ and those who, like me, had only ‘seen’ it before as various forms of threads on a screen or printed copies of messages. Essentially, I wanted to capture the textual *practice* of CMC rather than to view it as a series of textual artefacts or as ‘turn-taking’ within a chronological or technological sequencing diagram or table. I developed ‘mapping’ in response to the inappropriateness of existing models of recording and showing online activity in this particular context. I needed to do this in a way that would be meaningful within the case. Models which focus on frequency of postings, threaded patterns of weaving, or Initiation-Response-Feedback (IRF) (Feenberg, 1989) and conventional person- (or *ego-centred*) sociograms did not address sufficiently what is important in the online textual interaction for this study. I needed to articulate briefly and explicitly the foundation of my research in the social construction of professional learning through online textual interaction, and this was a strong factor in needing to develop a context-specific mapping system, produced by the case. It was extremely difficult to find a satisfactory model which captured the essence of what actually happens with texts between teachers online, and so I developed my own. This led to the ‘borrowing’ and adaptation of approaches from sociometric theory, which embraced a mathematical path I was not

expecting to follow, but which proved effective in provoking questions about the nature of textual interaction in the group.

The mapping needed to show the ways texts connected in the online discussion forum used by the MTeach group, Yahoogroups. This is a password-protected electronic forum where messages are posted as emails to the group to form a ‘discussion’ and they appear in order of date-of-posting. They can also be received as individual emails, or as a ‘daily digest’ containing all new messages received in order on a day. It is essentially a medium which stores messages chronologically to facilitate online exchange. Though messages can be viewed by ‘group topic’, this is not intuitive, and relies on subject headers being used consistently by the participants. This meant there were challenges in ‘seeing’ the overall pattern of what was going on. Unlike purpose-designed educational discussion environments, Yahoogroups does not record messages as discrete threads, and does not have a transparent way of showing at a glance if a message has received any responses. This was liberating for me however as a researcher, as it meant that I did not have a means of organising or tracking the textual activity imposed on me by a Virtual Learning Environment (VLE). I had to decide what was relevant to know about the inter-relatedness of the texts, and design my own way of ‘knowing’ what was going on as a preliminary way of organising and understanding the online texts as data. It also meant that the forum itself may have impacted on the amount of textual interactivity, since it is not as ‘invitational’ or ‘intuitive’ as some purpose-designed VLEs. I investigated within the bounds created by the case context however, and the study does not speculate on the properties of the discussion forum in eliciting postings.

3.3.1 Sociometric theory

Synder’s term ‘borrowing’ is apt to describe how sociometry became a helpful way to start the mapping, although it involved considerable adaptation. Sociometry is:

a way of measuring the degree of relatedness among people. It is a methodology for tracking the energy vectors of interpersonal relationships in a group. It shows the patterns of how individuals associate with each other when acting as a group toward a specified end or goal (Criswell in Moreno, 1960, p. 140) (Hoffman, 2001, n.p.).

The method, developed by Moreno (1960), originates from socio-psychology and applies mathematical techniques to investigate the emotional and social relationships within groups. It is based on the notion that people make choices in groups based on criteria which reveal their orientation towards others in the group. These choices can be ‘mapped’ to show the relations between people. Moreno developed ‘sociograms’ which represent visually what can be otherwise difficult to grasp in a complete way – that is an understanding of how a group is connected in terms of dynamics – who is popular, unpopular, trusted etc. – whatever the criteria are about. From the choices people make, “a description emerges of the networks inside the group. A drawing, like a map, of those networks is called a *sociogram*. The data for the sociogram may also be displayed as a table or matrix of each person’s choices. Such a table is called a *sociomatrix*” (Hoffman, 2001, n.p.).

Clearly, considerable adaptation was needed, since I was not investigating individuals, nor specifically their psychological motivations within a therapeutic context, which is Moreno’s rationale for the method. It did have a strong relevance however, because it supported the principle of being able to ‘see’ the texts and their impact on the group in terms of which texts elicited responses and helped in an early stage of the study to clarify what was going on when teachers wrote in an online group. Sociometry is based on the principle of asking questions to individuals to elicit answers about preferences for others in the group. From the answers, a sociogram is drawn showing the distribution of responses in the form of networks. A ‘sociometric star’ is a person (or point) named by a large number of others in relation to a criterion. A ‘null point’ is a person who does not attract any responses. In relation to the texts written in each discussion, I was looking at a variation on this. I wanted to find out how people were engaging with each other’s texts, by mapping the responses which texts attracted. This was not therefore an explicit question put to the teachers, but rather a mapping based on their naturalistic interaction within textual exchange.

3.3.2 Graph theory

It is necessary to explain ‘graph theory’ in relation to how the maps were constructed. Graph theory helped me to understand the maps and to learn that a mathematical perspective is compatible with a qualitative case study and can enrich understanding of

what is being investigated by sharpening the focus on what is happening within very clear bounds. This was particularly helpful as the first stage in data collection and analysis and helped formulate the shape of subsequent qualitative data collection. A sociogram is based on the mathematical concept of ‘graph theory’. Graph theory is not to be confused with the more familiar use of graphs to present variables and analyse data. A graph is:

A set of lines connecting points, and graph theory consists of a body of mathematical axioms and formulae which describe the properties of the patterns formed by the lines...it is the pattern of connections that is important and not the actual positioning of points on the page (Scott, 2000, p. 13).

In graph theory, “There is no one ‘correct’ way to draw a graph” (*ibid.*, p. 68). I used *directed* lines (i.e. with arrows) to establish a relationship, i.e. a response, between a person in the group and the text produced by another person. The presence or absence of a relation (here a response to a text) is the important thing in the graphs I made. Graph theory allowed me to analyse the patterns by focusing on: *adjacency* (the direct connection between two points) between authors of texts; the *neighbourhood* of a point or text (the points to which one point is connected); the *degree of connection* with other points/texts (the number of members in its neighbourhood) and *paths* which are the longer links made by a sequence of lines between points. Importantly for the study, it allowed me to measure the *density* of relatedness in the graph, that is the number of lines of connection in relation to the total possible number of connections which could be made. From this a ‘calculation’ can be made of how ‘interactive’ a community is, based on responding to others, but obviously not on the quality attributed to different texts as impacting on learning. It does not set out to indicate quality, nor to presume that the number of connections has any relation with conceptual richness. It is a way of seeing ‘what is there’ and the act of developing a mapping system demands working closely with the data as a whole, gaining close knowledge of how the whole discussion fits together. It further demanded critical judgements about what it was that I was really trying to find out by experimenting with ways of representing the relatedness of the online texts.

3.3.3 Developing a method for mapping texts

The first attempt at a map was to present the texts by making the teachers the starting point of the exercise, using a conventional form of *ego-centred* mapping as demonstrated in the example below. Ego-centred mapping takes the *person* as the unit of analysis, and constructs all the connections within a social context around individuals. At the start of the research, my ‘borrowing’ was insufficiently critical, and I attempted to adopt the conventional sociometric procedure, but soon learned this would have to be adapted to allow me to explore my core interest in the texts the teachers wrote.

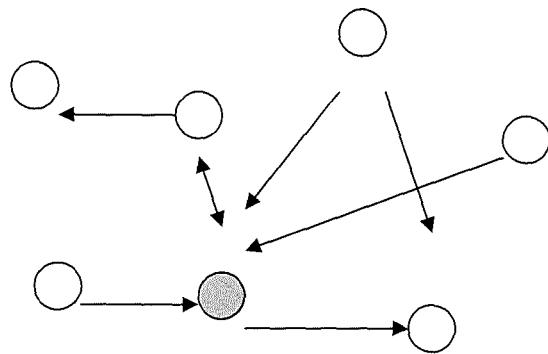


Figure 3.1 Conventional sociogram based around a person, shaded

This approach then, was used as a basis to map every connection the teachers made with a peer’s text and the lines became a complex constellation around each teacher. Arrows were used to show the direction of a response from one teacher to what another had written. To map fifteen teachers in this way was extremely complex and it was difficult to gain an overview of what was going on in the group as a whole. The lines were multiple and cross-referenced to such a degree I abandoned it. The problem here was that the individual teacher became the primary focus of inquiry and interpretation. There were fifteen of them, involved in multiple postings when simultaneously recording them responding to texts and receiving responses to their own texts. This type of sociogram is not conducive to this type of context. It would have worked if I had wanted to focus on individual teachers but this was not the intent. It was extremely complex as a way of looking at the whole of the textual activity and diverted attention from the picture of the exchange of texts which I wanted to create which was centred on the impact of the texts, not the activity of the teachers. I needed something text-centred – this was an important development in the case in relation

to establishing a unit of analysis for examining the phenomenon of text-based CMC and TPL. The problem was that I had started by ‘borrowing’ ideas from the conventional socio-psychological base of sociometry, which links individuals to their social contexts and is person-centred. The individual teacher is not the object of the study however, and I had to reassess my rationale in approaching the sociogram like this. The conclusions in Chapter 2 regarding the community dimensions of TPL and CMC were that “the communicative function of community is stressed as being core to establishing the meaning of what people do, thus enabling them to take future actions” (2.3.2.6). Community is conceptualised as what people do together in order to learn, rather than a collection of individuals, and the implication of this is a move away from person-centred views of networks for learning. In the case context, the learning community exists through text-based CMC – it is what the participants do together which constitutes them as a group who learn. This is the theoretical basis which accounted for by abandonment of a conventional sociogram format, and why I needed to develop my own model for mapping online interaction, based around the text as the first object of interest. I developed this model as the three first online discussions of the module ‘Research and Professional Practice’ (RPP) progressed over time. By doing so I came to know what was going on *between* the texts extremely well.

The unit of analysis for mapping the texts emerged from this process. The complexity of the phenomenon offered several ways of considering this, but the process of organising textual material to form data led to the clarification that it is the text, not the teacher, which is the focus of analysis. Further to that, the mapping process made it clear that I could not treat whole messages as single units. I mapped responses made with specific reference to how a text was generated by reading another text – the specific relatedness between them. So, my units of analysis are the textual chunks which were written around the response to a specific text – the evidence of being affected by other participants’ writing. In mapping, the responses were the most important thing – the MTeach works on the principle of constructing knowledge by responding to what others have written. The construction of the responses is not dictated – they can be a whole message, or can be paragraphs within a message, or just a sentence within a longer message. The participants must make clear they ARE responding to someone’s particular message, and nearly everyone did this (five messages in total across the three discussions were ‘general’ responses and did not make it clear which messages had prompted the author to respond). The messages were usually

broken down very clearly into paragraphs of response to different people. At other times, the whole message was developed from responding to one text. Some ‘responses’ just acknowledged another text. Others elaborated on the ideas it contained, and constructed entire paragraphs or a complete message as a development of ideas based on the original text. Therefore, the unit needed to be flexible enough to reflect this. The responses were mapped, not the messages. Some messages contained 2 or 3 interwoven responses to other texts, and could not be broken down into separate sections. I call these composite units – they reflected a response to more than one text, and were mapped as two or three lines connecting the text with all the ones it is related to. It was important to do this, rather than preserve a sense of the original wholeness of the message. For example, in this response from a teacher in discussion 3, her writing was a composite response to the impact of the texts from both Mary and Jane:

Both Mary and Jane talked of various solutions to how to get teachers interested in reading more research, a morning per term perhaps is the answer, let's say this time was available, or a twilight session that many schools now have as aprt [sic] of the use of thei [sic] INSET time, so then what would you do? if you just told teachers (105 of them in the case of my school) to go and read some research, they would moan, claim they couldn't or wouldn't do it and try to sneak off early.

A message like this counted as two units because it contains two instances of textual contact with other texts. It was written as a composite and the impact of the two texts written by Mary and Jane cannot be separated, but the message appears twice on the maps, once with a link to the text written by Mary and once with a link to the text written by Jane. Appendix I contains an example extract of the transcript from Discussion 2, to illustrate how the responses broke down into units of analysis. Within the appendix, the responses are shown in nested form within the messages which they constitute, in the order in which they were written, so that a sense of the discussion of a meaningful whole is retained, but the units were used within that framework to map the inter-relatedness between the messages.

Each teacher’s first online message posted to a discussion was prompted by a ‘task’ set within the MTeach module, and this first message was the starting point for the mapping. It was recorded along the row ‘Participant task’. This recorded these messages as intact texts,

as these were not ‘responses’ and were therefore not treated as units of analysis to construct the maps. This was followed by mapping the responses each task attracted by drawing lines connecting the responses to the text. Thus the numbers 1, 2 and 3 in the example below show that the online task from participant 2 was posted and received two responses, one from participant 12 and one from participant 15, within messages which they have written. These I called the ‘primary responses’, meaning they were the first level of responses to a text and made a direct connection with it. The response from participant 12 elicited two further responses, one each from participants 5 and 13. These I called the ‘secondary responses’ indicating that these are responses to a response. Participant Task 3(PT3) has no lines connecting it with any participants, showing that this initial message containing P3’s task did not get any responses. ‘Tertiary responses’ were those sent in response to secondary level responses – a response to a response to an initial task. These only happened in discussion 3.

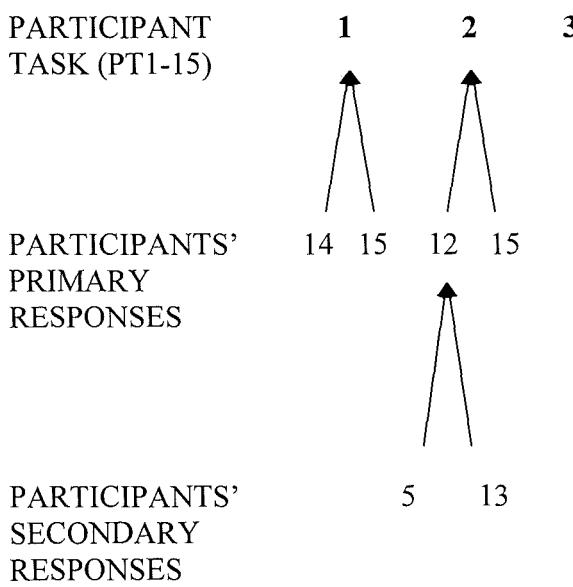


Figure 3.2 Example of mapping

Participants’ total responses sent in each discussion were then recorded along a row above each participant. Thus in the example below, participant 1 responded once to another participant’s message. Participant 3 made four responses to the messages from others in the

group, although receiving no response herself (this does not mean P3 sent four messages to others in the group, but made a connection with four other messages). Therefore her own initial text has no lines connecting it with any others. Participant 2 made two responses to messages from others, plus one 'general' response, which means she stated that she was responding to what the 'group' appeared to be discussing, but did not refer to a specific message as the basis of response.

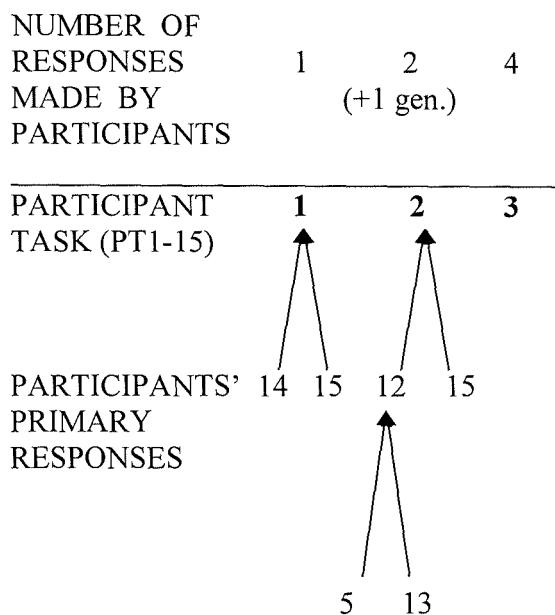


Figure 3.3 Example of top row added to record the total responses made to texts by each participant

A map emerged for each discussion which shows the total pattern of responses to texts (Figures 4.1 – 4.3 in Chapter 4). The pattern is determined by the amount of responses elicited by the different postings, indicated by lines. The patterns reveal the adjacency between individuals (connected by lines) and the neighbourhoods (the number of people connected to a particular text) which emerged. From this it was possible to analyse the patterns of participation with texts and the overall degree of complexity of the discussions in terms of ‘connectedness’, which is contained in Chapter 4.

The mapping was a developmental process. I mapped the first discussion after it was completed, following the order of participants on the tutor group list (P1-15), again starting

with a sense of the importance of the individual as the focus of ‘keeping track’ of what they did. By the time I mapped the second discussion, I had deepened my understanding of the focus of the research, and changed the mapping process to be driven by each text in the order in which it was posted, so the texts drove the development of the map, not the individual.

This process showed me that the choice is mine of how to manipulate data to show what is important at this stage in thinking about the case. Ultimately, what was important was that I focused increasingly on texts, not teachers as individuals. It was not about ‘the persons’ in terms of them being an ‘activist’ or ‘pragmatist’ or any other of Salmon’s (2000) typographies of learners for example, which might better suit an ego-centred sociogram. I wanted to know about the texts – to give me a preliminary understanding and way of articulating what was going on as an interactive practice, before looking more closely at the content for evidence of TPL.

By doing this I learned things about the textual dynamics of the group that were not observable before. The teachers – and me – would not be able to tell that some of their peers gained no responses to their postings unless they chose to very carefully monitor every posting. The only person who really knew what was going on in relation to individual ‘impact’ was the participant who would (presumably) notice if no one replied to their posting. My maps were designed to show two facets of the texts – what texts impacted in terms of eliciting responses, and the amount of responses which individuals made to their peers’ texts. I was not investigating which teachers were more or less active since I do not take ‘activity’ to be an indicator of TPL. By making the unit of analysis the response, not the message, I rejected an association between number of postings and levels of intellectual activity or commitment to learning processes within the group.

‘Mapping’ contributed to the meaning of the data and moved on the nature of the investigation. I constructed the data in these maps and altered it, turning it into something else. This is what Brown and Dowling (1998) explain is integral to researching texts – a text is ‘an instance of something else’ and the case goes through various formulations of what ‘else’ the texts are, each of which acts as one ‘micro-narrative’ within the overall

picture of TPL within CMC. The presentation and analysis of the mapping data is in Chapter 4.

3.4 INTERVIEWS WITH THE TEACHERS

The interviews were conducted not to examine the teachers' subjective states as individual cases, but to find out about the collective impact of participating in CMC on professional learning. The case is constituted by moving between 'getting in deep' (Schostak, 2002), formulated by moments of intense personal insight into experience, and returning to the global and abstract levels (*ibid.*, p. 77), "a move from close-up to broad view and back again" (*ibid.*). As a method established in the social sciences, it treats knowledge as 'constructed between participants' and 'intersubjective' (Cohen, Manion and Morrison, 2000, p. 265). The interviews aimed to encourage participants to offer rich accounts of their experiences, and to investigate the contradictions which can exist between internalised responses and transformations, and the participant 'performance' which is enacted online, as learners exercise increased power over self-disclosure (Blake, 2000, p. 194). To enable this process of 'getting in deep', a narrative approach was adopted. Cortazzi (2001) has argued that narrative is a way of engaging qualitatively with experiential data, and can enable understanding of learning experiences from the dual perspective of both the learner and the researcher. This involves using narrative approaches in two ways: treating the interviews as learner narratives which can reveal aspects of the teachers' learning; and using narrative analysis as a research tool by which to understand the interview transcripts. A narrative approach to interviewing is based upon the significance of Bruner's (1985) work on 'the meaning of experience' and his arguments for 'believability' that is based on experience. It accords the researcher an explicit role in constructing the meaning of the interview narratives, which in this case supports of the concept of 'inquiry as stance' (Cochran-Smith, 2003), by which the researcher is persistently exploratory and contributes to the meaning of the data. A full treatment of narrative methodology is given in Chapter 6, (6.2), to introduce the interviews as they contribute to the case development at that stage.

The interviews were semi-structured, a variation on Cohen, Manion and Morrison's (2000) summary of typographies of interviews, with a set of questions asked in common to all the

respondents. Different emphases could be pursued according to their responses however, so that the issues being examined “would benefit from development and clarification” (Wilkinson, 2000, p. 47), because they are complex and the interview situation afforded opportunities for me to elicit further consideration from the teachers. At the same time, the semi-structured interview maintained a purposeful aim, relevant to the specific research focus. This is because the method does not seek to understand the teachers from a biographical perspective, and thus does not allow for entirely unique and idiosyncratic accounts of their experiences of learning online. The study is not of them as fully realised individuals. The questions sought to establish their perspectives within six areas of participating and learning as teachers within CMC, derived from the theoretical perspectives examined in Chapter 2:

- A. Prior experience of online learning
- B. Participation
- C. Writing online
- D. Community
- E. Learning
- F. Professionalism.

The three key question areas were participation, their perceptions of writing to communicate online, and on their experience of community (question categories B, C and D). These have been identified by the literature as constituting ‘joint thinking’ and ‘meaning-making’ in TPL and affecting the agentive dimensions of this. The first question area asked for contextual information and was less directly relevant, although clearly the categories are inter-related, e.g. prior experience of online learning may affect sensibility to social relations in the community aspects of online discussion. The interview schedule is included as Appendix II.

3.4.1 The interview sample

A subset of teachers was selected to be interviewed, based on the findings from ‘mapping’ the texts and my reading as tutor of the online discussions. The teachers were chosen using a stratified sample based on the mapping, which revealed the range of response rates within

the group (see 4.4), as it was important to include those who have a diverse involvement in textual exchange. It was also a stratified sample to ensure that the interviews were representative of the phase and gender profile of the group, and included both school and LEA sponsored teachers. Stratified sampling “involves dividing the population into homogenous groups, each group containing subjects with similar characteristics” (Cohen, Manion, and Morrison, 2000, p. 101). Thus, the sampling was a process which I thought would provide the richest data and range of insights into what was happening online. The online discussion prior to the interview stage suggested to me, as the tutor, that teachers had both highly individual relations with the online exchange, but may also have been influenced by variables of gender and motivation related to their sponsors. I did not treat these as separate categories for data collection however, as this is not a study into the effects of sponsorship, school subject/phase or gender on teachers’ learning through participation in CMC. The ‘growth’ of the case was fully embedded in my knowledge as a tutor as well as researcher, and used this knowledge to shape the evolving data.

Therefore a representative sample of 50% of the group (n=8) were interviewed during the following year when they moved on to the non-taught research module. A pilot interview was conducted in December 2003, and changes were made to the questions to avoid repetition and to clarify terminology, reducing the interview time to approximately thirty instead of forty minutes. All but one of these interviews took place during the second year of the course, with the last one being held the following September. The interview sample represented the constituency of the tutor group in terms of gender, school phase/subject specialism (primary, secondary and special school teachers), and LEA/school support for studying for the MTeach.

Teacher	Phase/subject	Gender	LEA/School	Interview	Participant
David	Secondary/English	M	School	11.02.04	P2
Jane	Special/Primary	F	LEA	13.05.04	P3
Mary	Secondary/ICT	F	School	12.02.04	P5
Oscar	Secondary/History	M	LEA	16.12.03	P6 (Pilot)
Greg	Primary	M	LEA	22.04.04	P8
Kim Li	Primary	F	LEA	29.03.04	P9
Jenny	Primary	F	LEA	10.02.04	P11
Neil	Secondary/MFL	M	School	21.09.04	P14

Table 3.2 The interview sample

3.4.2 The pilot interview

A pilot interview was conducted with one teacher (P6) in his school, which lasted 40 minutes and was audio recorded and transcribed, as was the rest of the sample. In this I included questions which were trying more explicitly to elicit how the teacher felt about participating in the group. I had already cut questions on the advice of my supervisor, because they were trying to address the main target of investigation too explicitly and were over difficult (“Could you give a description of what you think participation in an online discussion is?” and “When you started to discuss online, what were your feelings about what you were doing?”). Now it is transparently clear that I was inexperienced in interviewing adults about difficult concepts, and I had assumed that because these were masters level teachers, they would be able to share in the discourse of inquiry that I was adopting. This had to be revised, as they had different perceptions of key concepts like these, and this was an important early discovery for me, in understanding the differences between my ‘readings’ of what they say online and what they may intend. It was the beginning of separating out individual ‘authorship’ of ideas, from the meanings which can be interpreted by the reader/listener. It was clear from the pilot that one of the questions I left in was still problematic in this regard, and that asking a direct question about relations within the community was inappropriate: the respondent was confused and the question did not elicit relevant material to the question “Could you describe the relationship between you and your online community?” Afterwards, my notes say “Question D4 on the ‘relationship’ with the group startled him, and he gave a very personal response, i.e. what he thought they thought of him. I don’t think it produced very helpful material for my purposes”. Another question “Did you notice the way that other group members were joining in the discussion?” was cut because it again, asked too directly in the target area of interest, and produced repetitive material that was clearer elsewhere in the responses. These questions were cut from the schedule. I further reduced the number of questions as two of them elicited material which repeated answers given more fully elsewhere (What made participation easier? What made participation more difficult?). I retained one question which the pilot respondent did find difficult but which he answered interestingly and this went on to elicit a variety of reflective responses from the interview sample. It was placed quite late in the interview so that the teachers were talking comfortably by the time I asked,

“What do you think are the features of an online community?” The interviews were conducted in the second year of the course, by which time the teachers had completed six online discussions and were in a position to think about this with extra time given for reflection within the interview.

The revised schedule was for twenty-six questions within the six categories, for interviews which lasted approximately thirty minutes. There was therefore a fast pace, which meant that the respondents gave their immediate responses to the questions, which they had not seen beforehand. This is because I was not attempting to collect detailed, experiential accounts of their interaction online. I am not attempting to build a picture of the teachers as fully realised persons requiring sustained engagement with their individual perspectives over time for example. The responses were intended to reveal the responses triggered by references to key aspects of text-based online communication, to elicit accounts of experience that could be as spontaneous as possible, given the interview situation. This is because the responses needed to be in contrast to the carefully considered time given to communicating in the asynchronous environment, where ‘disclosure’ can be carefully constructed around views which are expressed as the online ‘persona’. I wanted there to be little time for them to compose or craft their narratives, so that I might get a more spontaneous picture of how they react to issues of participation and learning within the online community. Both ‘spontaneity’ and ‘narrative’ are compatible with my aim to obtain reflective accounts of experience. The teachers were no longer engaged in online discussion modules at the time of the interviews and the coursework for those modules had been successfully completed by all the sample so there was less at stake for them as continuing MTeach participants. Time had passed since engaging in the online discussions, but it was recent enough for significant experiences which stood out to be remembered and reflected upon.

The interviews were transcribed and I applied an inductive approach to interpretation, using open coding to identify the key features which emerged from the data. Open coding is the process of identifying phenomena found in textual material, naming it and forming it into categories which can then be described. I wanted to be guided entirely by their experiential accounts at this stage, using an approach which is based on “The unstructured reading and rereading of the text with the researcher developing a narrative or interpretation that

eventually reveals the meanings within the text" (Anderson and Kanuka, 2003, p. 176). In this case, the reading and rereading was rooted in a narrative approach to textual data, in which the teachers' responses are treated as narratives, and their meanings are based on my interpretation, which constructs a further narrative of what has been said. See Chapter 6 (6.2.3) for a detailed explanation of the narrative analytical approach. I focused on paying attention to what the teachers said as unique insights into their choices about organising their thoughts in writing and the ways they chose to present their thinking to others, rather than identifying according to pre-determined categories. At this stage I relied on my own hermeneutical sensibilities and to being attuned to the teachers and the context as a source of interpretation to enable me to develop categories within the interview transcripts. The categories I derived would later be used to cross-reference with the findings from the qualitative content analysis of the teachers' online writing to analyse TPL. I am mindful of the 'constructedness' of the online texts and also of what is said in the interviews and transcribed. The online texts are only one representation of what is going on in the online exchange, and a full analysis must take account of the perspectives derived from the teachers as writers of the texts. Likewise, the interview transcripts are a rendering of what the teachers' actually said about their experiences of online writing in the community. All of the textual material is subject to the same interpretive stance. As a balance to the qualitative content analysis model I adopted with the online messages, I wanted to examine the interviews as a personal conversation between each teacher and myself, and my steering of that conversation relied on my intuitive responses within the social conditions of the interview. My knowledge of the teachers is an intrinsic element of the case, and the interviews allowed me to address that explicitly. I used my knowledge of the respondents at that point to engage personally with the data. The interpretation stage was a continuation of this process and was based on my relations and detailed knowledge of the teachers and the context in which the data was produced. As such, the interviews were subject to hermeneutical processes from dual perspectives – my own as researcher and the teachers as interpreters of their own engagement in online discussion.

3.5 METHODOLOGIES IN CMC

The final and most difficult aspect of the methodology has been the search for appropriate methods to examine the online writing of the teachers. Here, my close knowledge of the context of production is fundamentally different. Despite being the tutor, I was not present at the moment (or moments) of authorship, and cannot know the multiple factors which may have impacted on the production on the text which is the data. I had not intervened personally in eliciting messages from individuals and they are ‘separate’ from me in a way that the interview transcripts are not. It has confirmed the warnings from Laurillard (2002) and Rourke and Kanuka (2007) about the elusiveness of identifying learning in CMC. It has also been informed by my own scepticism about taxonomy approaches which I felt to be reductive and pre-determining of outcomes, and limit the scope of what can be identified as ‘learning’ (see Chapter 2, 2.3.3.2.1). The chief methodological concern has been how to examine the transcripts of the asynchronous, text-based discussions and to address Lapadat’s critical question of online interaction, “Can conceptual change be identified and tracked?” (2000). This is central to understanding the impact of CMC on teachers’ learning. The field includes a recently burgeoning literature on approaches to the analysis of online discussion, and an array of taxonomies and methods categorising features of the text to indicate some form of learning is taking place. The problem is that this literature, on the whole, is rooted in methods which, although claiming to show that learning is taking place within constructivist frameworks, offer little to show how methodologically there is a link between the methods used and the claims for evidence of knowledge construction which emerge. There is a real lack of analytical tools that tell us about learning transformations in ways which address the complexities of the phenomenon.

3.5.1 A sceptical stance towards positivist approaches to textual analysis

Research into CMC and learning has had a positivist focus on counting or categorising: patterns of participant interaction (e.g. Salmon’s (2000) nine ‘categories’ for analysing discourse analysis into ‘individual’ and ‘interactive’ thinking); linguistic discourse features (e.g. Fahy’s (2003) Transcript Analysis Tool which compares the frequencies and proportions of five sentence types – questions, statements, reflections, scaffolding/engaging, quotation/citation/paraphrase); language functions (e.g. Bradshaw et

al.s' (2002) Evidence of Learning Taxonomy based on learning actions within the text, e.g. offering ideas, asking, articulating, exploring). These studies use methods which are readily quantifiable and relatively easy to identify, but offer little in-depth analysis of the complex psychological phenomenon of learning in a social-interactive context. Rovai (2003) and McGorry (2003) have developed methods to gauge the impact of CMC on learning from a learner's perspective. McGorry's Likert scale, used to gauge students' experiences, collects data based on self-report. Using a numerical mean derived from Likert scales to indicate what is happening in the online forum is only a very reduced interpretation of the experience of learning however. Rovai categorises evaluation 'types' and focuses on 'input' 'process' 'output' and 'impact' to help structure an analysis of the student experience. 'Process' is the tricky part of this, which is the only 'type' to do with the actual learning that is happening and how it is happening, and offers little to work with in a practical or theoretical way. Both models are rooted in managerial/evaluation concerns rather than theory-building.

More qualitative approaches have been developed however, focusing on *levels* of reflexivity and higher order thinking as well as the *nature* of participants' cognitive engagement and conceptual change. These have focused on identifying the capacities of participants to make reasoned decisions, adapt to change, reason critically, collaborate productively, work independently, see multiple perspectives, be able to solve problems and engage in negotiating meaning (Laurillard et al., 2000; Lapadat, 2000; McLoughlin and Luca, 2000; Smith, 2003). A significant challenge in all these studies is the lack of transferability of indicators that capture the complexities of human learning in a way that makes them reliable across different contexts and which can be applied to TPL.

Preece and Maloney-Krichmar (2005) have shown that where a contrasting qualitative approach has been adopted, ethnography was a popular choice of many 'first wave' researchers to understand the social participatory aspects of communicating online, focusing on describing the social practices which people engage in and the community building aspects of these. None of these approaches satisfy the core methodological issue for this research however, which seeks to examine the impact of CMC on learning through the interplay of the individual and the social as it is constructed within texts.

Garrison and Anderson (2003) have described how the ‘second wave’ of research methodology in technologies and learning has encouraged greater attention to the specificities of learning practices in particular social contexts. This focus on specificity captures well the importance I felt, at this stage, of the need to find methods which gave such attention to the practices which are relevant to TPL. Their concept of the ‘sociocognitive turn’ connects the features of socio-constructivism and individual cognition in the context of CMC, but the methodological challenge remained how to identify this and make ‘discussable’ the connections which might exist which constitute teacher learning.

3.5.2 An inductive approach to analysing online texts

In developing an inductive stance to the methodology, the ‘critical borrowing’ was from the field of textual hermeneutics. Hermeneutics is concerned with a range of theoretical approaches to the interpretation of texts, not confined to literature: “there is always a great deal more at stake...such theories are more or less definite readings of social reality” (Eagleton, 1983, pp. 89-90). Hermeneutical theories, broadly speaking, have been characterised by a shift in the location of meaning within a text from the author or the linguistic construction of the text itself, to the reader as the prime, if not only, source of meaning. The significant shift in hermeneutical theories of text in the latter part of the twentieth century, was towards what can be broadly termed ‘reception theory’ or ‘reader-response theory’, by which the reader makes meaning according to a variety of contested perspectives. Freund (1987) summarises the diversity of approaches:

Agreement about the lie of the land is rare...The concept of ‘audience’ or ‘reader’ may be anything from an idealised construct to an actual historical idiosyncratic personage...Personifications – the mock reader (Gibson), the implied reader (Iser)...the ideal reader (Culler)...the informed reader or the interpretive community (Fish) – proliferate... (p. 7).

What is relevant to this study, and is the common theoretical argument within contemporary textual hermeneutics, is that the meaning of a text cannot stand independent of the reader. At the core of disputed hermeneutical approaches, is the question of whether the reader can entirely make the meaning of a text, and what relationship this has to a view of reality. The core difficulty is of recognising the relationship between an individual’s

interpretation, and the social and historical context in which the reader exists and is therefore able to think. The interpretation is not created by a sublime connection between a self and the text: “Most of us recognise that no reading is innocent or without presuppositions...all...responses are deeply imbricated with the kind of social and historical individuals we are” (Eagleton, 1983, p. 89). The ‘reification’ of professional phenomena within contemporary contexts involves the research process itself, since in the act of identifying what is being learnt within the electronic text, the researcher is contributing to the meaning of what is observed. What something means will be different for a different participant with a different set of relations to the events, and my researcher interpretation is only one of many that are possible:

The contemporary text now appears to be both permeable and malleable. The notion that the researcher constitutes the text contests the principles of objective and positivist research (Bassett and O’Riordan, 2002, p. 7).

As a co-constructor of meaning, the interpretation I make of the online texts is shaped by my belief system about professional learning, by my reading of literature and my experience in that world. Contemporary research perspectives, particularly in the field of textual hermeneutics, acknowledge the contribution of the reader/researcher to the meaning of what is observed:

...the task resembles that of forming hypotheses about the ‘content’ of...elements, and it is the work of making sense of these elements in all the possible combinations which they can contract with each other in the text (Kress, 2003, p. 37).

From this perspective the conflation of electronic text with authorial intention is highly problematic, and the reader is encouraged to resist viewing the participant as ‘human subject’. In constructing the text, each teacher has projected meanings from their lived experience – it is only a version or proxy for the experience itself, and the ‘impact’ of CMC can only be offered as an interpretation of what is written. In constructing an analysis, I insert what I think of as a further ‘semantic space’ between the person and the meanings which are derived: “Contemporary research perspectives, along with literary theory, acknowledge the impossibility of conducting research without altering the meaning of what is observed” (Bassett and O’Riordan, 2002). As a reader of electronic discussion,

significance is ascribed to features of the text in accordance with my interpretive stance. This is to acknowledge, methodologically, Kress's (2003) assertion that the meanings of texts depend on them being 'read in contemporary conditions...'. 'Contemporariness' is a key aspect of developing a methodology, and contemporariness includes the textuality of CMC, the nature of professional learning and the altered relations of learning brought about by engaging with CMC as a social and literate practice.

The 'literateness' of CMC has been examined in Chapter 2, and processes of 'filling with content' and ascribing meaning to construct knowledge based on interactive language-based practice apply to the research process as well as the teachers' learning. This is how the research continues to grow out of problems in the field, and the interpretation of texts becomes increasingly a matter of stance, here particularly influenced by textual hermeneutics as a key theoretical foundation to develop a methodology. Eagleton (2003) argues that the current state of textual analysis is emerging from postmodernism to what he has called 'after theory':

True meaning is neither carved in stone nor a free-for-all, neither absolutist nor laissez-faire....there are many different...features which will support your interpretation of it...what counts as a feature itself is open to argument. No critical hypothesis is impregnable; all of them are revisable (p. 96).

My narrative as researcher is therefore core to the interpretive process, and the development of a methodology for examining online texts was particularly rooted in my experiences and personal stance. In terms of my closeness to the context of production of the online text which I analyse, Eagleton rejects the concept of an 'ideal distance' to be established between the reader and the text, instead arguing that contemporary textuality involves the reader/viewer/listener in "constant focus changing" (ibid. p. 53), so that "we sometimes swoop in on a stray particular and sometimes pull back to pan the whole". There are implications for the case approach in contemporary theories of textual interpretation. This epistemological stance demands an openness to understanding whatever the text suggests and willingness to use a variety of ways of reading it and understanding it from the perspectives available, all of which is affected by my role as a researcher, tutor and learner. This is to root the possibilities of readings in my role as co-constructor of textual meanings. In this case it is impossible to justify an approach to interpretation based on meanings as

fixed or certain. A main methodological decision has been whether or not to adopt a procedure in which the text is explored for indicators or categories which are pre-determined, being informed by current theoretical perspectives on professional learning and the transformational properties of CMC, or whether to adopt a heuristic procedure in which data are not fitted to pre-assigned categories. Schostak (2002) presents these two directions for hermeneutical research into texts, to explain two possibilities of a case approach, the first being:

...one begins with the acceptance of some bit or expression of knowledge or of some mental attitude as a given for discussion. With this in place as an accepted focus in a universe of discourse one tries to expose the conceptual map that permeates this universe, hoping to reveal the otherwise hidden logical lines of force (p. 87).

The alternative hermeneutical foundation for a case approach is “the move from describing ‘what happens’ to explaining ‘why does this happen?’ (ibid.)” This latter question is to do with causality, the search for the generating conditions of, in particular, the impact of ideas on practice. The ideas can become so expanded that Schostak advises it is essential to ‘keep close to the data’ and attend to the methodological importance of narrative as underpinning a case approach to establishing meaning. In my development of a methodological approach to the analysis of online discussion texts, I have found a need to explore both directions described by Schostak. Adaptation has been key to developing a methodology unique to the case, which has enabled me to ‘keep close to the data’ and place myself in different relationships with the teachers’ texts, both ‘swooping in’ and ‘panning the whole’ (Eagleton, 2003), looking at them from the perspective of a diagrammatic ‘overview’, as an involved interviewer of the authors, and finally through detailed reading for an analysis of their conceptual content. I have ‘swooped in’ by adapting the model of qualitative content analysis (QCA) from Garrison and Anderson’s ongoing developmental work (2003). This has enabled me to interpret texts within a structured qualitative approach, and to critically consider my sceptical stance towards taxonomies and review how they may be used by a qualitative researcher.

3.5.3 Qualitative content analysis (QCA)

Qualitative content analysis allows...for the emerging interpretation of the researcher to guide the analysis...allows us to position, relate, and ultimately understand the abstractly inferred content from higher-level processing of the text and interaction...thereby allows us to work with the meanings that underlie the content rather than directly with the content. (Anderson and Kanuka, 2003, p.176)

Garrison and Anderson (2003) have described subjectivity as the ‘pervasive’ issue in content analysis. As a strategy which seeks to address the needs of qualitative researchers, the content analysis approach has been developed over time by a continuing refinement in qualitative adaptations of a content analysis model (Garrison, Anderson and Archer, 2001; Anderson, Rourke, Garrison and Archer 2001; Anderson and Kanuka, 2003; Garrison and Anderson 2003) to include a methodology outlined by Garrison and Anderson as an ‘inductive’ application of content analysis.

In a series of research partnerships, these researchers have grappled with the methodological problems of reconciling the fact that we do not read texts ‘naively’ in a situation where we are close to the data. It is *how* to work with the knowledge, values and dispositions that we bring to the interpretation that is the source of their ongoing development of a model for QCA over four stages, and of how I have continued this in my own application of it to TPL, and reassessed my initial evaluation of the value of taxonomies for qualitative research.

Anderson and Kanuka begin with the first version of QCA, of *unstructured reading and rereading* of the text, aimed at the formulation of “a narrative or interpretation that eventually reveals the meanings within the text” (2003, p. 176). This is something which foregrounds the reader explicitly as making the meaning of the text, but does not engage with the factors which influence that interpretation. In excluding the use of taxonomies, the model is suggestive of hermeneutical isolation, and of a ‘pure’ relationship with the material, which is untouched by the reader’s relationship with the rest of the world. The problem here is it neglects the ‘contemporariness’ of reading, and the need to embrace a way to understand as fully as possible – what Anderson later calls ‘exhaustively’, echoing

Eagleton's warning about resisting singular ways of interpreting meaning which is "neither carved in stone nor a free-for-all" (2003, p. 96).

A systematic structure for reading is introduced to the second version of the QCA model: "A grounded theory-based content analysis involves the careful study of the artefacts of the investigation...and coding the content into categories. Grounded theory tends to concentrate on extracting the categories inductively as they emerge from the data (open coding)" (ibid.) This then forms the basis for combining categories based on theory to formulate a hypothesis, but such an approach neglects the conscious engagement with the self as researcher that is core to a case approach in which the *intrinsic* element is as important as the *instrumental* approach to the issue being examined. This stage of their thinking about QCA still resists conscious engagement with the self as researcher as located in the world and in a field in which I am aware of the prevalent theories affecting the ways I might organise my responses, and cannot 'suppress' what is known outside of the text. The case is *situated* and the contemporary contexts of TPL are core to interpreting the teachers writing, and Schostak's warning to resist 'relentless abstraction' in a case approach is relevant to this iteration of a QCA model.

The third type of content analysis defined by Anderson and Kanuka seems to revert to a reductive focus on taxonomies based on a deductive approach: "The text is coded based on an existing theory originating from within another context...often referred to as hypothetico-deductive...we argue that a preconceived and formatted set of categories can be used to guide qualitative coding" (ibid.). The problems with pre-existing taxonomies have been discussed, and counter this optimism that qualitative outcomes can be achieved. The team of researchers was aware of this tension and in a further refinement, a fourth iteration of this model has emerged, which moves content analysis towards an inductive methodology, and is outlined by Garrison and Anderson (2003) as an 'inductive' application of content analysis. This has been the catalyst for my own development of a model to interrogate the online texts.

3.5.4 The Qualitative Content Analysis model

Garrison and Anderson's approach to understanding intellectual progress in CMC is developed from what they identify as the constituent *elements* of a community of inquiry. Chapter 2 identified their concept of a 'community of inquiry' as a methodological approach with high potential to be adapted to examine the qualitative aspects of teachers' thinking which are necessary within an 'inquiry' perspective. This is because a community of inquiry fosters critical thinking through "self-correcting practice driven by dialogue" within the community, where "community evokes a sense of cooperation, trust and common purpose" (Parsell and Duke-Yonge, 2007, p. 182). Garrison and Anderson's (2003) model is based on the premise that a community of inquiry develops critical thinking through the interdependence of two critical processes – cognitive and social. Cognitive presence corresponds to phases of practical inquiry, beginning with a 'triggering event', and involving 'exploration' and 'integration' of ideas, finally achieving 'resolution'. Social presence is key to critical thinking where it is constitutive of 'open, affective communication and group cohesion' (ibid., p. 30). Garrison and Anderson also argue that teaching presence is the third key element in learning within a community of inquiry, because 'there is an inherent need for an architect and facilitator to design, direct, and inform the transaction' (ibid., p. 29). Three key elements are therefore argued as essential to learning in CMC: cognitive presence, social presence, and teaching presence. They establish *categories* which constitute these elements. These are derived from the researchers' experience of working with and researching online texts, and from their knowledge of relevant theoretical perspectives. Thus they invoke real world experience as well as theoretical knowledge in developing categories by which to read and interpret the text. The development of a methodology has a highly iterative relationship with the data. A preliminary reading of the text establishes *indicators* that the category exists. The indicators are derived from the 'surface' of the text, and are explicit and recognisable. They are not brought to the text from the 'outer' world, but are identified as existing within the text. From this they build the first stage in a framework for analysing the quality of learning in online discussion based on the three core elements, as below:

TABLE REDACTED DUE TO THIRD PARTY RIGHTS OR OTHER LEGAL ISSUES

Category	Indicator
1	1
1	2
1	3
1	4
1	5
1	6
1	7
1	8
1	9
1	10
1	11
1	12
1	13
1	14
1	15
1	16
1	17
1	18
1	19
1	20
1	21
1	22
1	23
1	24
1	25
1	26
1	27
1	28
1	29
1	30
1	31
1	32
1	33
1	34
1	35
1	36
1	37
1	38
1	39
1	40
1	41
1	42
1	43
1	44
1	45
1	46
1	47
1	48
1	49
1	50
1	51
1	52
1	53
1	54
1	55
1	56
1	57
1	58
1	59
1	60
1	61
1	62
1	63
1	64
1	65
1	66
1	67
1	68
1	69
1	70
1	71
1	72
1	73
1	74
1	75
1	76
1	77
1	78
1	79
1	80
1	81
1	82
1	83
1	84
1	85
1	86
1	87
1	88
1	89
1	90
1	91
1	92
1	93
1	94
1	95
1	96
1	97
1	98
1	99
1	100
1	101
1	102
1	103
1	104
1	105
1	106
1	107
1	108
1	109
1	110
1	111
1	112
1	113
1	114
1	115
1	116
1	117
1	118
1	119
1	120
1	121
1	122
1	123
1	124
1	125
1	126
1	127
1	128
1	129
1	130
1	131
1	132
1	133
1	134
1	135
1	136
1	137
1	138
1	139
1	140
1	141
1	142
1	143
1	144
1	145
1	146
1	147
1	148
1	149
1	150
1	151
1	152
1	153
1	154
1	155
1	156
1	157
1	158
1	159
1	160
1	161
1	162
1	163
1	164
1	165
1	166
1	167
1	168
1	169
1	170
1	171
1	172
1	173
1	174
1	175
1	176
1	177
1	178
1	179
1	180
1	181
1	182
1	183
1	184
1	185
1	186
1	187
1	188
1	189
1	190
1	191
1	192
1	193
1	194
1	195
1	196
1	197
1	198
1	199
1	200
1	201
1	202
1	203
1	204
1	205
1	206
1	207
1	208
1	209
1	210
1	211
1	212
1	213
1	214
1	215
1	216
1	217
1	218
1	219
1	220
1	221
1	222
1	223
1	224
1	225
1	226
1	227
1	228
1	229
1	230
1	231
1	232
1	233
1	234
1	235
1	236
1	237
1	238
1	239
1	240
1	241
1	242
1	243
1	244
1	245
1	246
1	247
1	248
1	249
1	250
1	251
1	252
1	253
1	254
1	255
1	256
1	257
1	258
1	259
1	260
1	261
1	262
1	263
1	264
1	265
1	266
1	267
1	268
1	269
1	270
1	271
1	272
1	273
1	274
1	275
1	276
1	277
1	278
1	279
1	280
1	281
1	282
1	283
1	284
1	285
1	286
1	287
1	288
1	289
1	290
1	291
1	292
1	293
1	294
1	295
1	296
1	297
1	298
1	299
1	300
1	301
1	302
1	303
1	304
1	305
1	306
1	307
1	308
1	309
1	310
1	311
1	312
1	313
1	314
1	315
1	316
1	317
1	318
1	319
1	320
1	321
1	322
1	323
1	324
1	325
1	326
1	327
1	328
1	329
1	330
1	331
1	332
1	333
1	334
1	335
1	336
1	337
1	338
1	339
1	340
1	341
1	342
1	343
1	344
1	345
1	346
1	347
1	348
1	349
1	350
1	351
1	352
1	353
1	354
1	355
1	356
1	357
1	358
1	359
1	360
1	361
1	362
1	363
1	364
1	365
1	366
1	367
1	368
1	369
1	370
1	371
1	372
1	373
1	374
1	375
1	376
1	377
1	378
1	379
1	380
1	381
1	382
1	383
1	384
1	385
1	386
1	387
1	388
1	389
1	390
1	391
1	392
1	393
1	394
1	395
1	396
1	397
1	398
1	399
1	400
1	401
1	402
1	403
1	404
1	405
1	406
1	407
1	408
1	409
1	410
1	411
1	412
1	413
1	414
1	415
1	416
1	417
1	418
1	419
1	420
1	421
1	422
1	423
1	424
1	425
1	426
1	427
1	428
1	429
1	430
1	431
1	432
1	433
1	434
1	435
1	436
1	437
1	438
1	439
1	440
1	441
1	442
1	443
1	444
1	445
1	446
1	447
1	448
1	449
1	450
1	451
1	452
1	453
1	454
1	455
1	456
1	457
1	458
1	459
1	460
1	461
1	462
1	463
1	464
1	465
1	466
1	467
1	468
1	469
1	470
1	471
1	472
1	473
1	474
1	475
1	476
1	477
1	478
1	479
1	480
1	481
1	482
1	483
1	484
1	485
1	486
1	487
1	488
1	489
1	490
1	491
1	492
1	493
1	494
1	495
1	496
1	497
1	498
1	499
1	500
1	501
1	502
1	503
1	504
1	505
1	506
1	507
1	508
1	509
1	510
1	511
1	512
1	513
1	514
1	515
1	516
1	517
1	518
1	519
1	520
1	521
1	522
1	523
1	524
1	525
1	526
1	527
1	528
1	529
1	530
1	531
1	532
1	533
1	534
1	535
1	536
1	537
1	538
1	539
1	540
1	541
1	542
1	543
1	544
1	545
1	546
1	547
1	548
1	549
1	550
1	551
1	552
1	553
1	554
1	555
1	556
1	557
1	558
1	559
1	560
1	561
1	562
1	563
1	564
1	565
1	566
1	567
1	568
1	569
1	570
1	571
1	572
1	573
1	574
1	575
1	576
1	577
1	578
1	579
1	580
1	581
1	582
1	583
1	584
1	585
1	586
1	587
1	588
1	589
1	590
1	591
1	592
1	593
1	594
1	595
1	596
1	597
1	598
1	599
1	600
1	601
1	602
1	603
1	604
1	605
1	606
1	607
1	608
1	609
1	610
1	61

which the structure for coding evolves. The definition of elements of learning needs to be clear, and is a qualitative process because it is 'I-as-researcher' (Schostak, 2002, p. 10) who determines these, based on coherent values and experience, and who makes this defensible within relevant theoretical perspectives.

Thus, again, the researcher is highly involved in actively constructing the data and the picture of what is emerging as TPL which is affected by CMC. Garrison and Anderson claim that their categories and indicators are theoretically derived, though they do not specify the processes involved, and this became a problem for me in the pilot I conducted. It led ultimately to a significant revision of the first attempt adopted by the case. It is possible to derive categories and indicators relevant to teachers' professional learning, but the field is extremely complex – for example, how many ways are there of 'indicating' that 'community' is present in a text and impacts on TPL? To prescribe the indicators may work for initial coding, but what is to be done with rich material which does not fit an indicator exactly, or fits more than one? An inductive approach to examining the transcripts was used in the pilot and then refined to make different decisions about criteria for coding and the framework for analysis adopted by the study.

In order to trial this methodology and establish its relevance to examining professional learning as the 'content of interest', I conducted a pilot investigation with an online discussion with a different group taught by a colleague. The pilot serves as a vehicle for explaining the workings of the QCA model in detail, as without being situated in actual data it is rather abstract. The case development becomes apparent through the account of the pilot and reflection on its adaptation to this particular context. A preliminary to conducting the pilot was to identify the unit of analysis appropriate for this approach.

3.5.5 The unit of analysis

Content analysis requires the text to be divided into units which can be the focus of meaningful analysis in that the unit can furnish evidence of the construct which is under investigation, and can do so 'consistently and exhaustively' (Garrison and Anderson, 2003). For mapping the online discussion as the first stage of analysis, the 'response', embedded within messages, emerged as a meaningful unit of analysis. The Garrison and

Anderson model of QCA however is built on the ‘message’ as the unit. They argue that the message is the most appropriate unit for identifying conceptual content. This is because the nature of the construct being examined is highly complex, which applies to how TPL has been conceptualised in this case. Because of the complex nature of conceptual content, Garrison and Anderson argue that it is observable only within the message as a whole. It works within text-level analysis, based on the linguistic concept of cohesion which links parts of a single text towards a consistent purpose or meaning. In other words, a meaningful narrative is necessary for a unit of analysis. In mapping the responses of the messages as ‘units’ or segments of the text, I read the messages to identify meaningful narrative units as responses, and once I had established that one of these existed, the unit was complete. Garrison and Anderson do not comment on internal narratives such as these within whole messages, so the application of ‘responses’ as units to the model becomes problematic. Responses do contain narrative coherence. They do not however meet the demand for conceptual wholeness within a message. Where several responses exist within one message they have a conceptual function within the message towards building knowledge. This is where the literateness of CMC as a practice is an important concept. For mapping, I was not concerned with the qualitative content of the responses – I wanted to identify connections between messages as an indication of CMC as fostering relatedness between texts, based on acknowledging another text as the foundation for the ideas related to it within the message. The ideas themselves were not the subject of qualitative analysis. Identifying qualitative conceptual content however, required examining the texts as literate wholes – taking account of writing as “a medium where there is time to reflect, to re-think, to use language as a way of shaping thought....” (Kroll, 1981, cited in Chapter 2, 2.2.5.2.) Conceptual content emerges from the whole of the message, which might also be a ‘response’ in its entirety, but may be the result of more than one response which leads to a change in perception or understanding over the length of the message as a whole.

Hermeneutical perspectives are therefore necessary to determine the unit of analysis for QCA. There is causality in written text (Kress, 2003), and the unit of analysis must reflect this if the construct is to be apprehended within its means of construction. The narrative function of the text (Polkinghorne, 1988) in making meaning means that it must be read as a whole to be subject to a method of analysis. A basic narrative theoretical principle is that a text is ‘a holistic cultural object’ (ibid., p. 85). I was acutely aware of the difficulty of

what the study sets out to do, and of the lack of literature on the meaning-making processes in online discussion beyond narrow discourse analysis or taxonomy approaches. From the field of psychological understandings of the construction of meaning in narrative contexts, Polkinghorne's argument, after Bruner (1985), is that narrative is the 'primary form' by which human experience is made meaningful, meaning that the narrative function of the text needs to be maintained as a psychological and social unit, i.e. the terms in which it was experienced by the author (which is not the same as what it *means*) and the terms in which the author made it available to others – the message. The message here is viewed as a complete episode, carrying the same hermeneutic possibilities as Tripp's (1993) 'critical incident', concurring with Polkinghorne's (1998) assertion that "Narrative creates its meaning by noting the contributions that actions and events make to a particular outcome and then configures these parts into a whole episode" (p. 6). This can be applied to the relationship between responses as narrative units within single messages. Polkinghorne claims that linguistic data presents problems of analysis "since linguistic statements are context-sensitive and lose much of their information content when treated in isolation" (ibid. p.7) and thus narrative theory contains grounding for Garrison and Anderson's assertion of the message as the unit of analysis as the most apt evidence of conceptual work.

The pilot therefore explored the feasibility of applying the QCA model to the case context, and of working with the message as a unit of analysis. At this stage, Schostak's (2002) warning that the phenomena being examined in a 'case' may not have "any internal unity of consistency" (p. 17) became fully understood within this context. As well as a warning though, Schostak's argument is that this is also the chief potential of the case approach – to deal with the complexities of social phenomena, which have multiple forms and shift according to the perspectives adopted. Being dogmatic about a singular way of conceptualising a phenomenon runs contrary to what a case approach can offer. Schostak's emphasis is that individuals make sense out of their lives and manage interactions by a 'repertoire of codes' (ibid.). Making meaning in CMC is not a fixed practice, and the elusiveness of learning in this practice demanded flexibility in understanding the teachers' online writing as having multiple forms and purposes which construct meaning – the teachers experienced the texts as both messages and responses. This repertoire required adaptation from the researcher in making sense of them.

For the pilot I therefore adopted the message as the unit of analysis. Thus I could explore the potential of working with whole messages, and apply a methodological approach premised on the concept of CMC as a literate practice which is built on writing as a cognitive tool, as outlined in Chapter 2 (2.2.5.1-2). The online discussions within the MTeach took place through a set of initial postings based on a task, and at least one further message sent as a ‘Response’. The postings were relatively long (250-300 words on average) and analysis of the mapping of the online texts showed that the discussions have relatively low levels of ‘density’ – responses are limited to a relatively small number of postings, out of all those that are theoretically possible. There was little response beyond the primary level (see Chapter 4, 4.2.9). Thus, the main opportunity for interpretation lies in the ways in which ideas were constructed over the length of the message. Although there was little to and fro between participants (see Figures 4.1, 4.2 and 4.3), the message content can reveal the presence of others online, and particular features of writing for fellow learners over time. The interview data, collected prior to textual analysis, informed that the participants take time to compose these messages, and thus my knowledge of the context of the text production supported a pilot with the message as the unit of analysis.

3.5.6 The pilot

To trial an adaptation of Garrison and Anderson’s QCA model, I conducted a pilot based on an online discussion by a different group of eleven teachers who were studying the MTeach the following year.

The *content of interest* within the online discussion is teachers’ professional learning. From a theoretical analysis of this as a ‘construct’ I selected the core *elements* of professional learning for the pilot on an inductive basis. This was informed by theoretical perspectives and my experience of TPL within CMC. My knowledge of the complexity of concepts like ‘joint thinking’ meant that I resisted at this stage what I considered to be ‘atomistic’ and hypothetical categories which I felt were too abstract. Instead, I attempted a holistic approach which, on reflection, conflated and over-simplified the categories when it came to a systematic analysis. Thus ‘participation’ came to act as an umbrella term for the range of

features which might indicate ‘joint thinking’ and ‘meaning-making’. The experience of pilot coding using the QCA model led to a different view on how to carry this forward in the case, although it did prove to be workable and feasible as a vehicle for working with the data and testing out the analytical approach. For the pilot I used the following elements to organise how the material could be read and to provide a framework for interpretation.

<i>Content of interest</i>	<i>Elements</i>
Teachers’ professional learning	participation collaboration agency

Table 3.4 Elements of teachers’ professional learning (pilot)

I developed the first element, participation, into a template for coding which consisted of the categories and core indicators of participation which impacts on TPL. The categories were derived from the literature which is analysed in Chapter 2, and identified as: *knowledge construction, community, metalearning, autobiography and cognition*. The derivation of these pilot categories is summarised in Appendix III. The categories are not hierarchical, and include both individual and social perspectives on learning. Garrison and Anderson are not very explicit about the theoretical underpinnings of the selection of categories and indicators for coding in current accounts of qualitative content analysis. This I have now found to be critical to the qualitative and interpretative nature of developing the case around QCA. Categories and indicators were derived from the analysis of theoretical perspectives on TPL and from experience of knowing the types of things which the teachers write about in their discussions. My role as tutor affected my choices and I synthesised individual and social aspects of TPL in my choice of categories and indicators. In my ‘holistic’ approach, I resisted ‘steering’ in a way I saw as detrimental to the ‘truth’ of the data. I was still learning that *every* intervention in the data ‘steers’ its representation of ‘what is’. I had not fully taken on Brown and Dowling’s (1998) assertions that the text is an instance of something else, and was attempting to make the model reflect *what is*. Garrison and Anderson’s QCA model has *interpretation* as the essence of organising the data as well as the analysis. As a result of these reflections I needed a more systematic way to assign the categories and indicators, and to design the model so that it stayed as close to the case focus

as possible. That meant working with the literature to hone and focus on the indicators as discrete entities which reflect those identified in the literature review, rather than general themes which emerged from it. I now think it is only by using and ‘living with’ such a model that its true intricacies can be discovered and used as a basis for development and the pilot was vital to this. For this reason, I will use the pilot to explain the workings of the model so that it can be as ‘situated’ to share its role in developing the case.

3.5.7 Indicators

Under each category of ‘participation’, indicators were identified to be searched for in each message. A typology of indicators was derived from a preliminary reading of the messages based on recognition of key types of surface features which reappeared with consistency. The pilot typology consisted of twenty indicators which were used to search the text at a surface level for all examples exhibiting these features:

<i>Category</i>	<i>Indicators</i>
Knowledge construction	Reassessments New ideas/proposals Questions/enquiries Endorsements/verified ideas Modified ideas
Community	Shared values/goals Seeking/giving support Statements expressing mutuality Practice-based exchanges
Metalearning	Verbalising the learning process Verbalising understanding Verbalising difficulties
Autobiography	Critical incidents Personal reflection Teacher identity Learner identity
Cognition	Statements of understanding <ul style="list-style-type: none"> - theoretical - critical - practical References to personal learning

Table 3.5 Pilot categories and indicators of TPL for the element ‘participation’

There were thirty messages in the whole discussion, sent by a total of eleven participants. The task required an initial posting in two parts, followed by a response:

Initial task posting (part 1)	11 postings
Follow-up posting (part 2)	10 postings
Responses (whole messages)	9 postings
Total messages	30

Table 3.6 Total messages in online discussion used for pilot

An initial reading of the messages made it clear that only the responses were of relevance to the content of interest, since the initial task postings, sent before reading anybody else's, were highly individualised and self-contained forms of text which did not reveal a sufficient mass of data to indicate any effects of the interactive environment (and that is not their intention). The responses (whole messages, n=9) revealed the richest data in the form of narratives which show thinking as a result of engaging with the postings of others, with a total of 89 examples of the five categories.

3.5.8 Manifest and latent variables

The sample texts were then scrutinised to identify an example of each of the indicators for the five categories, producing in the first instance what Garrison and Anderson call *manifest* variables. Manifest variables consist of readily observable features of the discourse which occur at declarative level, i.e. what the participants say they are thinking, how they report on their actions and learning episodes, how they use language in conscious ways to establish community and purpose and relationships with their peers. This is the first stage of coding. For example, the statement “it’s a big relief to find out that other people are also concerned with this issue...” is a manifest variable of the category ‘community’, identified by the indicator ‘shared values/goals’. Table 3.7 below shows the examples of the manifest variables for each of the categories which were drawn from the sample.

TABLE REDACTED DUE TO THIRD PARTY RIGHTS OR OTHER LEGAL ISSUES



TABLE REDACTED DUE TO THIRD PARTY RIGHTS OR OTHER LEGAL ISSUES

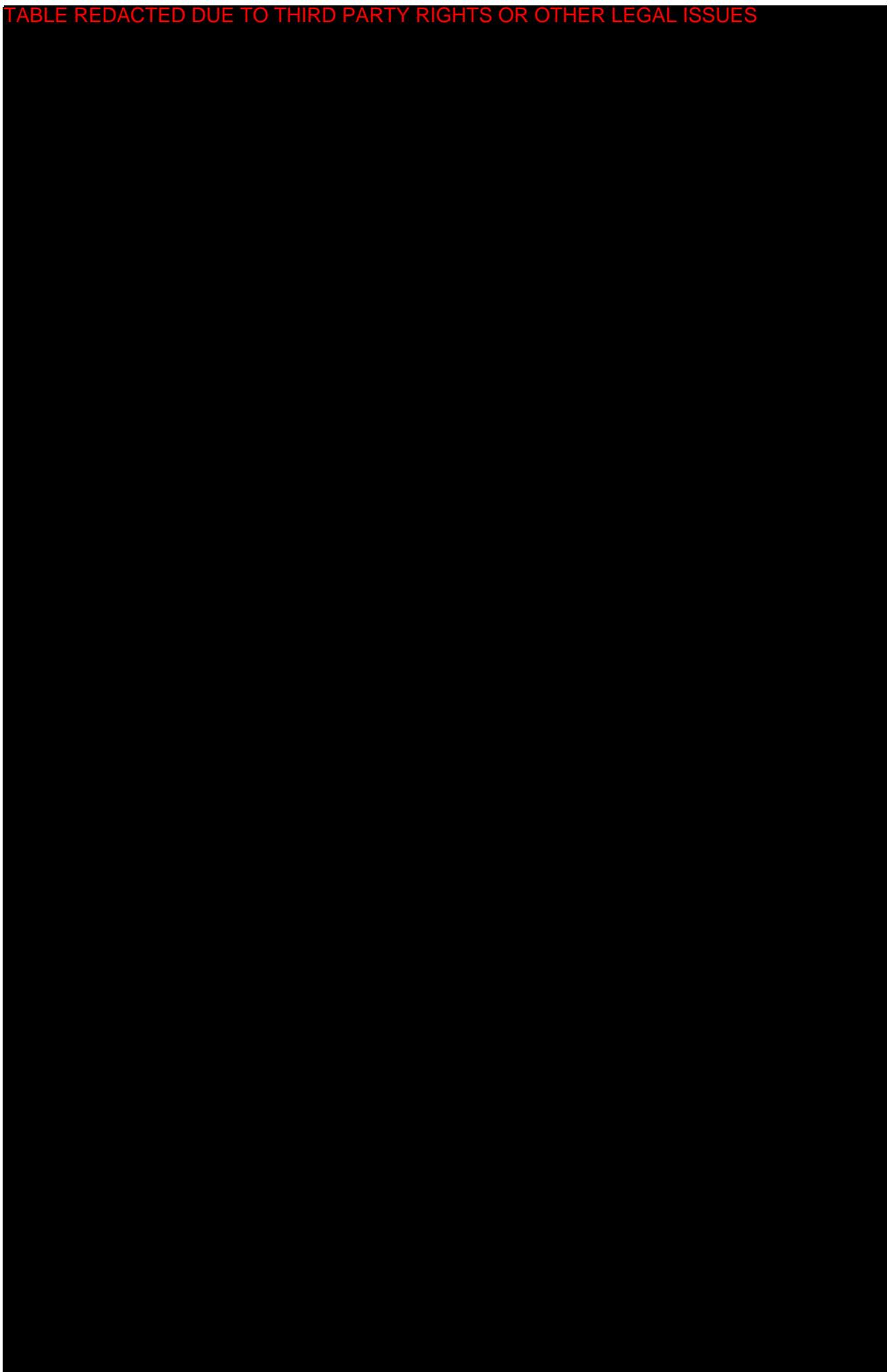


TABLE REDACTED DUE TO THIRD PARTY RIGHTS OR OTHER LEGAL ISSUES

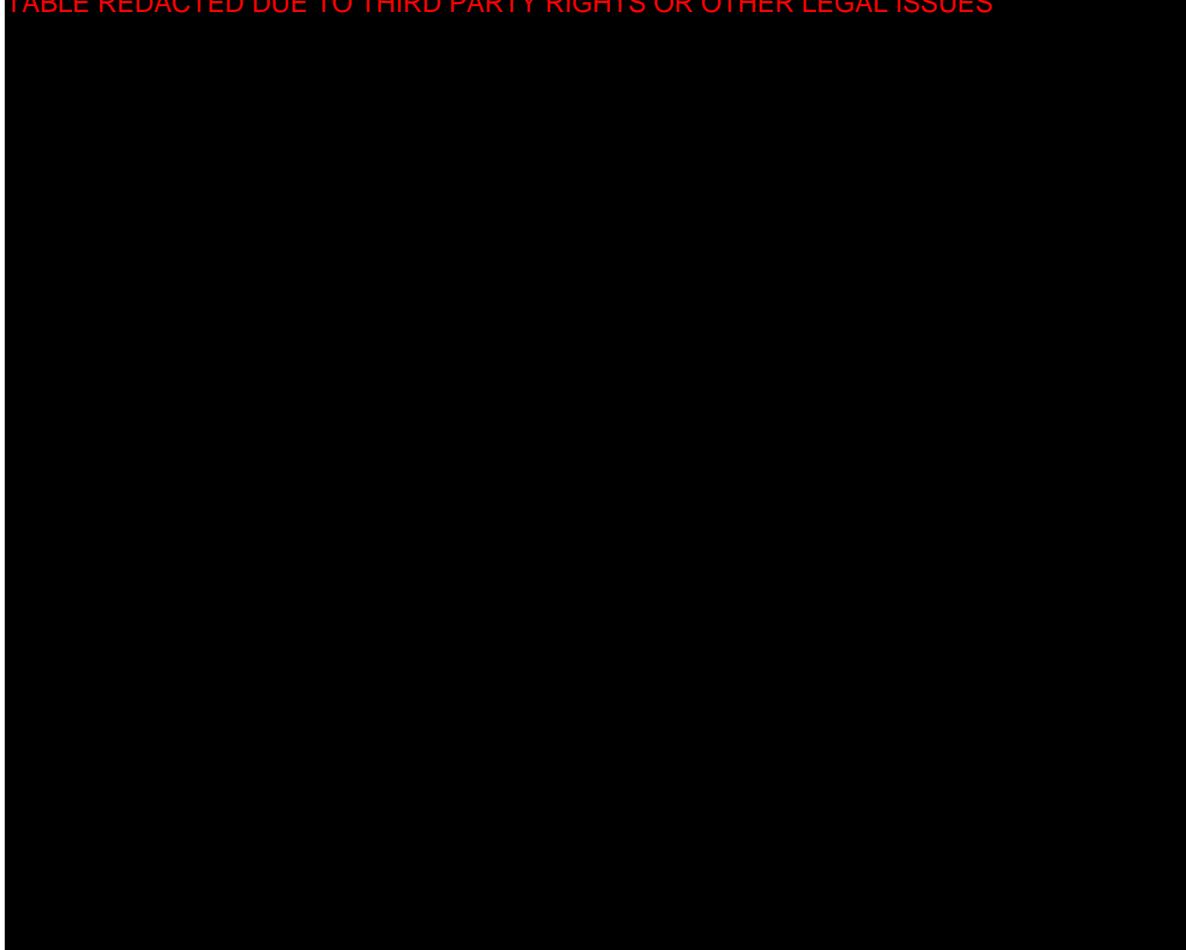


Table 3.7 Professional learning categories and example indicators, adapted from the QCA model for research into computer mediated communication (Garrison and Anderson, 2003)

Once the manifest variables were identified, an analysis was made of the prevalent features of the teachers' writing across the examples. It was at this inter-textual level that the effect of collaborative processes on teacher meanings could be traced. For the pilot, I completed a data set ($n = 16$) for one of these categories (Table 3.8, below), *autobiography*, and analysed the data. Each example includes a reference number to the message where it originated in the context of the whole discussion. The messages were numbered in order of posting, 1-30.

Category: Autobiography	
Indicators	Examples
Critical incidents	<p>“He couldn’t understand why I couldn’t understand...” (25)</p> <p>“I can think of numerous moments in my career where I have had to stop and think...” (25)</p> <p>“We recently had a very interesting INSET evening where...” (27)</p> <p>“This was brought clearly home to me today when I had 9D1. Suddenly [pupil] was not in his usual ‘I hate geography’ mode...” (28)</p> <p>“Today a year 7 class were busily completing...” (29)</p>
Personal reflection	<p>“Reflecting on my related learning experience I can see that...” (25)</p> <p>“The types of learners, learning experiences, motivation and methods vary and make for a fascinating catalogue of narratives of experiences” (27)</p> <p>“The introduction of a computer produced the most amazing...It is clear that by using different learning styles students can learn by the methods that suit them best. It must be our job to provide these different styles...Every lesson in geography cannot include computers but if I can instill a learning orientation within students they can learn...” (28)</p> <p>“[Today a year 7 class were...] It became clear that it didn’t matter if they got the answers right, there was a much more useful activity going on...they did learn a fair amount about...but more importantly they learnt that it was the taking part that counted...” (29)</p> <p>“Maybe the student [subject of narration] will understand the concept he was trying to explain tomorrow, perhaps, like you experienced, it was the way [the teacher] was explaining the concept that she just ‘didn’t get’ ” (26)</p>
Teacher identity	<p>“...schemes of work, time restraints...prevent me from being the teacher I would like to be” (29)</p> <p>“Part of my motivation for doing this MTeach is because I want to become a better teacher...not just better than I was before but better than other teachers who have chosen not to...” (21)</p> <p>“[The discussion...made me see]...so much of my feelings of self worth are tied up with my performance as a teacher and as a learner” (21)</p> <p>“Don’t get me wrong, I am not a rebel and have not refused to teach my subject’s syllabus” (26)</p> <p>“I have also had experiences where I have had to think of alternative teaching approaches...Sometimes this still fails and, as a colleague said to me just today...” (26)</p>
Learner identity	<p>“...they learnt it was the taking part that counted...it is more important to know how we learn” (29)</p>

Table 3.8 Indicators of the category ‘autobiography’

3.5.9 Working with manifest variables

From this first stage of classification, I could identify and describe two types of declarations which teachers make within the pilot *category* of ‘autobiography’ within the *element* of participation in TPL.

Type 1. Declarations that show they are engaged with the materiality of practice. They include references to a variety of workplace contexts and incidents which constitute the broader narrative world of the teacher, in which an interpretation of their learning must be located:

a very interesting INSET evening
when I had 9Di
the introduction of a computer produced
Today a Year 7 class were
Schemes of work, time restraints
The way [the teacher] was explaining the concept

Type 2. Declarations which show their reflections on their practice, which involve statements about their professional identities. They refer explicitly to conceptions of being a teacher, both as an individual state of being and as ‘being’ in relation to others:

I want to become a better teacher...not just better than I was before but better than other teachers
So much of my feelings of self worth are tied up with my performance as a teacher and as a learner
I am not a rebel
...prevent me from being the teacher I want to be
Moments in my career where I have had to stop and think
I have had to think of alternative teaching approaches
It must be our job to provide...

A theoretical perspective informed the analysis of the manifest variables at this first stage of coding. I was able to interpret the content of the messages in terms of TPL as socially constructed through ‘talking within practice’ (Lave and Wenger, 1991), and of seeing learning as linking community with practice (Wenger, 1998). Declarations of both Type 1 and Type 2 together constitute the ‘politics’ of meaning-making at work, via the process of reification. By reification, professional phenomena are rendered meaningful by the ways in which people talk about them, and thus they constitute what it is to ‘practice’. Wenger’s theory of COPs establishes a relationship between the ‘things’ which constitute daily practice – INSET, teaching Year 7, using a computer, explaining a concept etc. (Type 1 declarations) – and the meanings which can be negotiated around them which bring about professional knowledge involving a high degree of impact on ‘feelings of self worth’. It seemed that an unarticulated but recognisable values framework, both personal and shared, is a resource which is drawn upon by the teachers to position themselves as having complex relationships with what they do. The sense of potential for conflict and disjunction was present but not fully articulated, and the texts were interrogated further to identify what lay behind a statement like ‘I am not a rebel’, where face value meanings are inadequate to explain all that is significant in such a claim (or denial), and where authorial intention is not helpful as an indicator of its potential meanings. The pilot showed it is possible to apply a relevant theoretical approach to the data, which has relevance to agentive ways of thinking in TPL.

3.5.10 Working with latent variables

This was the next stage in applying the QCA model. Garrison and Anderson’s ‘latent variables’ offered a means of conducting further investigation of meaning beneath the surface of the text. It is the latent variables within the teachers’ messages which were especially relevant to examining their learning, and were more difficult to observe. In the context of CMC, higher order learning has been described as ‘covert processes’ (Garrison and Anderson, 2003, p.140), but it is worth “struggling with the important (though hidden) facets of individual and social cognition rather than assessing that which is most easily measured”. This was vital in the context of the research.

This second stage involved the identification and analysis of latent variables which is necessary to reveal a “hidden ‘interior being’”, as explained in parallel work on this model by Anderson and Kanuka (2003, p. 175):

...Latent variables...include important concepts such as evidence of creative or critical thinking...[they] must be inferred from manifest content and this inferential procedure inevitably provides opportunities for inconsistencies and error on the one hand and insight and interpretation on the other. The nature of the latent variable influences the manner in which it is identified and described” (ibid.).

This approach has been developed by a continuing refinement in qualitative adaptations of a content analysis model: “Instead of identifying latent variables during coding, Holsti (1969) suggests postponing this type of analysis to the interpretive stage” (ibid.) in order to apply intuition and imagination to the interpretation of the data. In this approach, the coding is based on a framework or typology which is ‘induced’ and applied to the content. The final stage of content analysis proposes “an association between the manifest behaviours and latent variables such as critical thinking, judgement, and initiative” (ibid.).

Hermeneutic understanding uses processes such as analogy and pattern recognition to draw conclusions about the meaning of linguistic messages. This stage of the content analysis proposes an “inferential procedure to recognise variables in a pattern that is consistent across the textual content. The more difficult inferential procedure involves the recognition of ‘latent projective variables’ which are identified by judgements “based on a ‘projection’ of an abstract concept by the researcher” (Garrison and Anderson, p. 140). Abstraction in this research however, remains ‘close to the data’ (Schostak, 2002), and is fully embedded within the case concerns.

The teachers’ postings contained many references to their identities as teachers, both explicitly “the teacher I would like to be”, and implicitly by describing their actions: “It is clear that by using different learning styles...It must be our job to provide these”. There was however, a discomfort with the discourses of ‘good teaching’ (Moore, 2004) they draw on (both consciously and subconsciously), and they struggled to find a language which articulates different values and indicators of learning which are individual-focused and have a perspective of change over time according to personal contexts and goals. There was resistance to the managerialist discourse, to “...schemes of work, time restraints...”

which were seen as inhibiting self-aware professional practices and creativity, but at the same time they inhabited the language of target-driven performativity. “It must be our job to provide these different learning styles” reflects the duality of the teacher’s position, anxious to implement a recent government initiative on learning styles to support individual student differences, but missing the point by inhabiting the language of ‘delivery’ by aiming to *provide* the students with them. The co-existence of these conflicting concepts of professional practice was a source of confusion. “Don’t get me wrong, I am not a rebel” – the idea of resistance disconcerted, and yet the texts included ample examples of ‘rebelliousness’, but lacked an appropriate discourse that may be legitimately occupied by a teacher – being ‘a rebel’ was absolutely not seen as a possible role of the contemporary teacher. This duality was a source of considerable professional dissatisfaction for some, or proficient compromise for others who appropriated the discourse of the ‘competent craftsman’ (Moore, 2004). They wrote about themselves as practitioners in a way frequently marked by this duality, so that an almost (unarticulated) ‘schizophrenic’ professional identity emerged (Strauss, 1995). This was the theory which I could ‘project’ to identify the latent variables. The theory is not that they invented a new discourse in their online writing. Rather, the individuals drew on and negotiated the discourses which are available to frame the telling of their professional actions, and thus constructed the meaning of them. There was outright critique from some. Some though, took authenticity from their experiences and used this to challenge orthodoxies: “...they learnt it was the taking part that counted...it is more important to know how we learn”. Whatever the difficulties, there was a sense of mutuality in their struggle for a coherent professional identity which must be practised to ‘be’ a teacher, and a strong sense of shared professional ethics centred on a concern for the value of students’ learning experiences. There was certainly reflection, but more than a self-referential concern to perform better.

In summary, therefore, the latent variables which I identified from an analysis of the category of ‘autobiography’ in teachers’ professional learning are *transformation* and *struggle* through engaging with dominant discourses, professional redefinition and growing reflexivity.

3.5.11 Evaluating the pilot

The pilot therefore suggested there is potential in adapting the QCA model to identify the conceptual content within the online exchange and its relevance to key features of TPL, especially to do with agency, in the category examined. In working with the message as the unit of analysis, I was able to identify the indicators of the category 'autobiography'. Reading the entire message was necessary to identify some aspects of conceptual presence, although many such aspects would have been identifiable within the responses which constituted the messages. In reading the transcripts, there were examples though, of conceptual elements which were identified within the message as a whole, and the complete narrative assisted in recognising that they were there, and constituted them. For conducting QCA on the sample, I worked with the complete messages which contain the 'responses' which formed the basis for the mapping. Appendix I presents an example of these messages as data, with the responses 'nested' within them, so that it is clear that the messages are comprised mostly of internal units which are the 'responses'. This is the way I worked with the texts to be able to apply QCA. I have read the transcripts in detail several times to be able to construct the data in this way. This level of familiarity with the texts is essential to my presentation of it in this nested form. The whole of each message, as it appears in the data, is coded to assign content as indicators to the categories. The pilot worked with one set of categories and indicators to trial the feasibility of QCA as a working model, and in this respect it worked as a method of organising the data and as a vehicle for analysis. The understandings which are possible through the 'projection' of a theory based on one set of latent indicators, suggest that, when it is applied to the entire set of data, there is potential for an extremely complex hypothesis emerging concerning teachers' professional learning within CMC. The pilot suggested that the method is workable and allows for insights into meaning to be made at an intra-textual level which is vital to the research question and context of the online discussions. The early decision to focus on only certain types of messages ('Responses') as providing material relevant to intra-textual analysis was significant for managing the considerable amount of data to be analysed in the study.

What emerged as problematic is that the pilot did not address sufficiently the need for careful derivation of the categories and indicators. The *framework and procedures* of the QCA model were adopted, but this was privileged over a discriminating theoretical

engagement with devising the categories and indicators. The difficulties of deciding categories and attributing data to them indicate the inter-relationship between factors that might be expected of a complex. Garrison and Anderson's emphasis on 'consistently and exhaustively' scrutinising the text became fully understood as a result of reflecting on the pilot. The adaptation I devised did not sufficiently address a fundamental principle of the model. *Cognitive presence* and *social presence* are essential to the socio-constructivist core of learning, and involve both individual and social interactive dimensions in the identification of learning in CMC, which have been found to be important core constituents of TPL. I did not stay close enough to these two conceptual foundations of the 'educational transaction' in the derivation of categories. They require adaptation to the field of TPL, and following the pilot I revised the framework to reflect what is important in applying QCA to a theoretically derived view of TPL. Thus, cognitive presence needs to be named as something specific to TPL, which is 'meaning-making' and 'reification'. These *are* the essence of what is called 'cognitive presence' more generically. Specificity to the case was again important in clarifying the focus for TPL. The QCA framework made too great a leap from 'cognitive presence' to its 'categories' and then 'indicators'. Specificity became increasingly important in developing the model, and this was catered for by adding a further column to the framework, 'Specific elements of TPL', before deriving the 'categories' which constitute TPL. These revisions are discussed in the following section and shown in Table 3.9, below.

3.5.12 The revised model for QCA of TPL in CMC

Table 3.9 presents the revised model for QCA, which addresses 'cognitive presence' and 'social presence' in ways which arise specifically from the case concerns.

'Cognitive presence' needs to be seen as having a particular form in TPL. Intellectual engagement is identified as 'meaning-making' from a socio-cultural perspective on TPL, and as 'reification' ('*ascribing thingness*') from communities of practice. It is then available to be understood by categories which can be identified. The 'categories' for TPL are in fact 'form-giving' processes – they are practices, since teachers are actively constructing meaning within these categories and they are derived from theories of learning 'within practice'.

‘Social presence’ needs to be identified as both ‘joint thinking’ from a socio-cultural perspective on knowledge construction, and as ‘participation’ from communities of practice. Again, the categories which constitute this element are form-giving processes – they are the means by which teachers ‘ascribe thingness’ through shared practices.

The categories have been derived from the literature review and are based on my judgements and evaluations contained in Chapter 2 about the form-giving processes of TPL, by which professional phenomena ‘come into being’ and are made meaningful. These processes are both individual/cognitive and socio-interactive. The indicators are similarly based on the key findings in the literature, but also based in my experience of reading considerable amounts of teachers’ online writing, both in this case and more widely in my role as a tutor.

The development of the revised table takes account of the refinements to the research question in Chapter 2, based on conceptions of community (2.3.2.6) and agency (2.3.3.5). Community perspectives established these refinements:

1. What processes are socially binding in this context?
2. What ‘ways of talking’ indicate that meaning-making is present in the content of the teachers’ online texts?
3. What practices enable them to achieve participation and reification?
4. What are the features of teachers’ ‘specialized sensitivities’, an ‘aesthetic sense’, and ‘refined perceptions’ (Wenger, 1998, p. 81) about practice, which appear in their online writing?

Agency perspectives established the following refinements:

1. ‘joint thinking’ may be disruptive of orthodoxies and non-confirmatory of individuals’ beliefs and dispositions;
2. ‘filling with content’ requires teachers to critically interpret their own and their peers’ ‘telling’ about practice; and

3. ‘community’ does not imply consensual meanings, or social practices which amount to ‘interaction’ *per se*, but is an intellectual practice in itself which involves context-making, by which teachers can take charge of their own learning within a dynamic textual and social process.

The queries raised by these refinements are not separate, but are inter-related in the literature on TPL and CMC. They are captured in the model I adapt from Garrison and Anderson, appearing as six categories by which TPL can be identified in online discussion, involving: identity-building; meta-level engagement; teacher narration; scaffolding; argumentation and community-building. The six categories are in fact form-giving processes, after Wenger (1998), by which practice is rendered meaningful. The categories reflect the inter-dependence of the individual and the shared, the private and the public, as constituting the teachers’ learning within CMC. These categories then served as the focus for searching the text for evidence of cognitive and social presence. The literature identifies the ways in which a community learns by forms of social interaction and articulation about practice. These act as the indicators of categories – the means by which processes are conducted, and they constitute the ‘way of being’ in the online community.

Elements of learning	Specific elements of TPL	Categories (<i>Form-giving processes</i>)	Indicators (' <i>a way of talking</i> ' and ' <i>talking within practice</i> ')
<i>Cognitive presence</i>	Meaning-making	Identity-building	Autobiographical insights Stating values Raising ethical issues Identifying purpose
		Meta-level engagement	Discussing own and others' learning Reconsidering views Creating 'what if'/hypothetical scenarios
	Reification	Teacher narration	Critical incidents Situated accounts/episodes Reflecting on teaching
<i>Social presence</i>	Joint thinking	Scaffolding	Asking a question Answering a question Echoing/repetition Seeking clarification Modifying/augmenting ideas
		Argumentation	Proposing a new idea Agreeing Disagreeing Illustrating Using rhetorical devices (exclamations, humour, mock-expressions, metaphors, rhetorical questions)
	Participation	Community-building	Empathising Seeking peers' views Sharing a repertoire Engaging purposefully Expressing mutuality Social bonding

Table 3.9 Revised categories and indicators for a qualitative content analysis model for identifying TPL

3.5.13 Developing the model

These revisions involved a greater adaptation of the model, and involved careful derivation of the categories, thereby establishing a greater degree of ownership over it and coherence with TPL as defined by the case. This was important, as it restored responsibility to 'I-as-researcher', in fully shaping the methods to be consistent with my theoretical perspective

on TPL. In taking this to its full conclusion, Garrison and Anderson's third element of 'teaching presence' I have disregarded for the purposes of textual analysis in the case, since it does not apply to this particular context for TPL. Although it would be possible to identify and analyse the presence of the MTeach pedagogical design, as a tutor my intervention in the teachers' knowledge construction was minimal (restricted to two postings in discussion 3, and a 'summary' of the discussion posted after closing the discussion). The pedagogy of the MTeach rests on the principle of teachers communicating together online as the prime source of their professional learning. Although this is fostered by carefully structured tasks, I focused on the learners' practices as the core of TPL, and questioned the centrality of tutor presence in learning in CMC. Laurillard (2002) acknowledges the 'pedagogical advantage' of 'student control' in online discussion. The issue of what 'student control' really means however, needs to be developed to take account of the subtleties of the social and textual dynamic of the electronic environment, in terms of how participants exercise control over the relations which constitute knowledge through the manipulation of text and of personal and professional disclosure.

This challenges Laurillard's (2002) assertion that an effective learning community "is totally dependent on a good moderator" (p. 151), as teacher presence may be argued to reduce the potential agentive dimensions for learners. Her argument is premised on 'scholarliness' as generated by the frequency of iterative dialogue in which the tutor steers the discussion towards a particular conception of worthwhile second-order knowledge. It is rooted in the concept of the 'Conversational Framework', which is predicated on an iterative process in back-and-forth exchange, skilfully managed by the tutor-moderator as expert. This calls for a judicious degree of tutor intervention, which must try not to repress or over-influence student contribution – a difficult thing to achieve, and premised on notions of academic discourses which are acceptable in the formulation of knowledge, which is not an entirely apt way to describe constructivist processes which constitute reflexive and practice-based professional learning. Laurillard's recommendations show the difficulties of applying general ground rules or taxonomies across online communities which have unique purposes and designs. For each context for CMC, it must be asked whether the absence of this tutor-dependent iterative process is a problem. Lea (2000) warns about the ways that tutors' tendencies to dominate online discussions result in teacher-led ideas and attitudes dominating students' thinking.

While I would agree with Laurillard that there are no studies to suggest that “this is the kind of medium where students can be left to work independently” (2002, p. 151) I would disagree that success lies in moderator intervention throughout the discussion, and dispute the high profile of the ‘expert’ presence in the discussion itself. The expert role in the template and task design is critical, and in establishing the initial online engagement. Her resistance to student-student interaction as a prime learning process relates to a scepticism concerning undergraduate student experience as knowledge that is valuable in comparison with what is termed ‘academic’ (or ‘second-order’) knowledge: “if you accept that academic knowledge is knowledge of descriptions of the world and will become known through operations on descriptions, then teaching must be a dialogic process” (*ibid.* p. 71). Laurillard’s context is chiefly undergraduate education, but this alone does not explain her dependence on ‘experts’ to intervene in student learning in online discussion. On one level, the hierarchical division of knowledge does not satisfactorily describe experienced teachers’ professional learning – the learners’ experiences in the world are not ‘limited’ by being ‘first-order’ (or ‘experiential’). This is not to argue that there are not different forms of knowledge, but that the hierarchical organisation is not commensurate with socio-constructivist ideas about knowledge derived from context-making and shared ways of knowing. It is also significant however, that the majority of her examples are taken from positivist disciplines, such as mathematics and science, and refer less to the contribution made to ‘knowing’ by the learner in humanistic subjects in which meanings are not fixed but are more open to interpretation and dispute.

Therefore, in treating CMC as a literate and interactive practice, I focus in the model on the relationship between cognition and social interaction in the teacher data. This is the core interest in the case, and the teachers’ engagement in both individual and social knowledge-construction through online discussion. The first two categories of cognitive presence and social presence allow for extensive exploration of this.

3.5.14 The derivation of the categories and their indicators

The revised categories and indicators were derived from the literature examined in Chapter 2, and are summarised as follows.

Identity-building

Identity-building is an agentive aspect of TPL. It involves the articulation of a collective sense of purpose and values in the practice of teaching, as well as the consideration of individual values and self-worth related to being a teacher. This can include statements explaining the nature of beliefs. Reconsidering the motives for practice is a part of this. It involves autobiographical insights into the careers of teachers over time, and the professional roles and duties which prompt them to consider what it is ‘to be’ a teacher, based on critical understanding of practice. Identity-building invokes the notion of the ‘historicised’ teacher and connects the professional self with the private. By this, private circumstances and beliefs affect professional action and beliefs. It is a core aspect of reflexivity. Its indicators are: *autobiographical insights; statements about values; raising ethical issues; and identifying purpose*.

Meta-level engagement

Meta-level engagement is a central aspect of developing critical thinking in TPL. It involves reflection on practice which goes beyond individual self-referential review, and involves collaborating with others to reconsider views. Teachers become proactive in suggesting hypothetical scenarios where practice is conducted differently, involving the development of ‘practical theories’. It involves teachers in the social dimension in making meaning, by discussing explicitly how their learning has been affected by contact with peers’ ideas, and commenting on how they have arrived at their views. It can involve explicit comments on how the teachers are learning together. The indicators for meta-level engagement are: *discussing own and others’ learning; reconsidering views; and creating ‘what if’/hypothetical scenarios*.

Teacher narration

Teacher narration involves teachers in relating to others their own lived experience, and using it as the basis for critical reflection and meaning-making. This can be in the form of

reflection on particular episodes from practice, or by situating ideas in general statements derived from the everyday lives and routines of teachers' practice, which are held in common. Teacher narratives can form the basis for explicit reflection on teaching, in which the desire to improve pupils' learning is a main factor, or for wider consideration of issues affecting practice. Thus it involves references to practice-related events and scenarios both inside and outside the classroom. The indicators for teacher narration are: critical incidents; situated accounts/episodes; and reflecting on teaching.

Scaffolding

Scaffolding involves teachers in intervening in the development of ideas articulated by others, by a range of techniques which draw out the significance of what has been written. It involves asking and answering questions; echoing and repeating or rephrasing what has been said to add new emphasis or use as a foundation to build on the idea; suggesting the need for clarification and modifying ideas, or augmenting them to extend or alter the meaning of what a peer has said. This reveals that a concept has been problematised, or a suggestion is made that there can be an alternative perspective or interpretation. Questions in this context are not rhetorical and frequently are addressed to the group as well as the person who originally contributed an idea. It suggests the initiation of a further way of thinking about an idea, and contributes to the provisionality of thinking. The indicators are: *asking and answering questions; echoing/repetition; seeking clarification; and modifying/augmenting ideas.*

Argumentation

Argumentation involves learning to argue by making the process of taking a perspective explicit. This is by statements which declare agreement or disagreement, which involve a variety of impacts on the development of ideas. A statement may express agreement or disagreement, but most often would then justify, qualify or hedge that assertion with a process of explaining why, or backtrack and state a contrary position. It involves proposing new ideas to provoke others into new areas of thinking. Illustrations and examples are used to demonstrate the appropriateness of ideas being presented, and rhetorical devices are used in an attempt to persuade peers of the veracity of what is being proposed. The indicators are: *proposing a new idea; agreeing; disagreeing; illustrating; and using rhetorical devices (exclamations, humour, mock-expressions, metaphors).*

Community-building

Community-building involves participating in the discussion in ways which establish mutuality and control over the context in which the group learns. It involves features which are socially binding, and which establish the shared dimensions of the learning by making the common bonds within the group explicit. It involves empathising with others as teachers and learners, on an individual and group level, which does not mean having the same views but attaching the same significance to concepts being discussed as being of professional relevance. References to shared stories, contexts and histories as teachers would form part of this, as would expressions of mutual professional purpose. Mutuality which builds community includes statements confirming the views of others, shared professional identity, being part of a group, and references to 'we' or 'us' to denote a collegiate identity in the experiences and views being articulated. The indicators are: *empathising; seeking peers' views; sharing a repertoire; engaging purposefully; and expressing mutuality*.

3.5 CONCLUSION

This chapter has established how the research adopted a case approach in which I make explicit the process of developing a range of perspectives to contribute to the construction of the data and its analysis. It has explored the three types of research methods used to develop the study: sociometric mapping of the online discussions; semi-structured narrative interviews with the teachers and qualitative content analysis of the online texts. I have explained that considerable adaptation has been needed in developing these methods to respond to the specificities of the case, and that the case has been more fully understood by the process of developing the methodology. The methodology has been developed by returning to 'I' as researcher, which has been especially important when engaged in 'critical borrowing'.

The methodology for QCA has allowed me to prioritise the act of reading and interpreting text itself as contributing to meaning-making. The adaptation of the QCA model was a considerable shift in my previously held beliefs about interpreting texts, based on resistance

to approaches which applied taxonomies. As a result of the pilot, I reasserted the need to 'own' a model, adapted from an existing approach. Flyvberg's (2006) argument about a case approach encouraging the opposite of verification of previously held ideas appears to be correct in this case. Garrison, Anderson et al.s' development of a QCA approach to researching online discussion has been the key influence in this aspect of the methodology. The approaches used in content analysis offered helpful organisational principles to a qualitative methodology, in that they suggested effective ways of organising texts in order to analyse them, and to distinguish the nature of the material which is of hermeneutical interest. It has been vital however, to retain my theoretically-informed stance on TPL in adapting the methods of textual analysis. Of key importance is that a 'responsible' adaptation of the QCA model brings together the individual and social aspects which are central to learning in CMC but also to TPL. Anderson and Kanuka (2003) explain that content analysis does not have to be rigidly quantitative, despite its main domain within computer-aided analysis. It is a 'crossover technique' because of the need for critical interpretative skills for the researcher to assign content to the variables which are used to code the text. I have appreciated what it means to work with a 'crossover technique' as a qualitative researcher, and have revised my reservations about the coding of transcripts based on indicators. This is because in this research, the categories and indicators were not borrowed from 'outside' the case, but emerged through the development of theoretical understanding of CMC and TPL. The selection process made this explicit and I found this to be consistent with a qualitative study which enables me to discuss the developmental issues at a meta-level.

The pilot has been critical to this development of both the model of analysis and the stance I have as researcher. It demonstrated the accuracy of warnings given about the challenges facing 'second wave' researchers and the demands of specificity. Snyder's (1998) advice that research into learning with technologies should 'grow out of problems and questions in the field' has been apt to this bounded instance of the broader context.

The development of methodology has involved considerable revision of previously held views on conducting qualitative research and the relation of methods to a case approach. Despite Schostak's advice that a case approach should involve exclusively qualitative methods, I have found it helped to explore sociometry and a QCA model developed from

quantitative methodologies, in addition to conducting interviews in a more traditional qualitative approach. This is compatible with adopting a qualitative stance towards interpretation and methods development, so that I have developed the case in response to what can be offered by inter-disciplinary and contemporary ways of understanding. This is because in a field with little established methodological consensus, 'critical borrowing' is vital – it requires to adapt with discrimination and create what is appropriate to a unique context.

CHAPTER 4 MAPS OF THE ONLINE DISCUSSIONS

4.1 INTRODUCTION

This chapter presents the data and analysis based on mapping the three online discussions within the tutor group, which took place between September 2002 – January 2003, as part of the first module on the MTeach. It presents the maps of the discussions and analyses first how the process of constructing the maps contributed to the meaning of the data, and then analyses the maps themselves as data which enable patterns to be identified which affect a view of ‘interaction’ and ‘community’ in relation to textual activity. I analyse the responses made to online texts for evidence of ‘relatedness’, meaning the degree to which texts are connected with each other, which is a condition in which the social construction of knowledge is possible. Analysis of the mapping data uses graph theory to establish the relatedness of textual activity among the teachers. I then analyse the contribution which mapping has made as a preliminary stage in investigating CMC in TPL, and how it shapes the next stage of data collection. The mapping raises issues for interpreting ‘joint thinking’, ‘meaning-making’, ‘community’ and ‘agency’ in teachers’ interactivity with texts, and steers the focus towards the group writing as a whole, rather than individual postings, as the source of textual evidence for TPL. It also focuses on problematising notions of ‘participation’ which are based on frequency of iterative dialogue among participants, and uses graph theory to describe the nature of the interactions.

The maps referred to appear as Figures 4.1, 4.2 and 4.3. Figure 4.1 is the map of online discussion 1, Figure 4.2 is the map of online discussion 2 and Figure 4.3 is of online discussion 3.

4.2 ANALYSING THE MAPS

Mathematical abstraction is not helpful to my stance in gaining understanding of essentially socio-constructivist processes of TPL with CMC. Statistics are used here to explore the interpretation of the maps within a qualitative perspective – I have borrowed with discrimination from a mathematical field which is applied in quantitative sociological approaches, and adapted it to be coherent with the narrative approach which develops the

case. From my qualitative stance, I began the process of ‘critical borrowing’ (Snyder, 1998), and the mathematical element needed to be meaningful and commensurate with my way of viewing phenomena as open to constant shift and multiple interpretation, given the human dimensions of the topic. The mathematics is not complex, and is accessible to non-mathematicians, but was appropriate to my needs as a qualitative researcher, and enabled me to work consistently with statistics to make meaningful analysis of social and human phenomena. It was a facet of working in inter-disciplinary ways to understand learning within the new contexts of CMC, and was a methodological departure I had not anticipated at the start of the research. The emphasis is therefore on the significance of the patterns which emerged from basic mathematical calculations rooted in graph theory and which were relevant to the context. I therefore present each map as an “analytical diagram” (Scott, 2000, p. 10), by which patterns in sociometric forms can give insights into human and social phenomena, bringing my knowledge of the rest of the case to interpreting the maps. The maps and the statistics which were derived from them through graph theory are presented together with the relevant stages of analysis throughout, so that they are meaningful and contextualised by the case concerns and by my interpretive stance. I found that by referring closely to the focus on inter-relatedness between texts, this sociometric grounding has high application to the social practice of CMC. The maps are analysed to explain the textual interactivity in a consistent way which allows them to be viewed as a whole, so that a detailed picture of the relatedness between the texts emerges.

I did not conduct a detailed analysis of each individual map, although that could have been relevant for a case with a different focus. My concern was to understand the text-based interactivity of the teachers by examining its forms and patterns rather than examining particular discussions or individual cases. For the same reason I did not examine the teachers as individuals within the maps, although the data could certainly have been organised differently and analysed to do this. I needed to focus on exactly what analysis I wished to draw out of the multiple possibilities offered by sociometry. The maps could have been used to examine CMC as ‘social networking’ which involves examining the flow of information or ideas between individuals, based on their responses to each other as units of analysis - and this is an angle which developed here; alternatives would have been to develop ego-centric maps based on individuals to examine inter-personal relationships affecting learning potential; or to have focused on groups and calculate memberships of

cliques which emerge across all three discussions to affect the community dimensions of textual interaction. My purpose was to examine the ways texts are related to each other within the discussions as a whole. The unit of analysis which enabled me to do this was the ‘response’ contained within messages. Textual interaction was the core concern, and thus I used the foundation principle of ‘relatedness’ from sociometry and applied it to textual interaction.

Presence and absence of relatedness is the basis of sociometric approaches to data. I analysed the presence or absence of a relation between texts in the three discussions, which started by looking at them as points on a map, which is a ‘graph’ or ‘sociogram’. Chapter 3 (3.3.2) explained the relevant mathematical concepts in graph theory to present and analyse relatedness in sociometric data within graphs, and how these relate to the texts in the study. The construction of the maps involved shaping the data by making decisions about what it is that needs to be shown about how the texts relate to each other, and what factors are used to decide how a text will be presented in relation to others. This process impacted on how I interpreted the data and what the lines which connect texts came to mean as a result of mapping.

In the maps, points represent online texts authored by particular teachers, P1-15. A number where it appears in the map therefore does not indicate a teacher as a person, but rather an online text (otherwise called an email message or posting) authored by that teacher which they posted to a discussion. There are two types of texts on the maps. The initial postings which were task-generated are shown in bold along the row ‘PARTICIPANT TASK (PT1-15). These were complete messages, and were the basis on which ‘responses’ were made. The unit of analysis is the ‘response’ and these are shown as points along the rows ‘PARTICIPANTS’ PRIMARY REONSES’, ‘PARTICIPANTS’ SECONDARY RESPONSES’ and ‘PARTICIPANTS’ TERTIARY RESPONSES’. These were not necessarily complete messages, but were responses to the task-generated postings. A participant may have sent a message which contained several responses to the initial participant tasks, and each one of these responses is a point shown on the map – so the number 10 may appear several times in a row of responses, even if that participant, P10, only sent one message to respond to the discussion. The following terms were introduced in Chapter 3 (3.3.2), and explained as core concepts in graph theory which was the basis for

sociometric mapping. These terms have been applied across macro-sociological contexts, such as studies of group trends within large communities, but originated in micro-sociological contexts of pupil relationships within specific classes (see 3.3.1 for the analysis of the ‘critical borrowing’ across contexts involved in applying the approach to this case). They are used here to explain how I constructed the maps and analysed the patterns which emerge from them:

directed lines use an arrow to show a one-way directional relationship between points, i.e. a response from one point to another point, here between one text containing a response to another text;

adjacency between texts (the direct connection between two points i.e. texts, where a text has been produced in response to another text);

neighbourhood of a point (all the texts to which one text, as a point, is connected);

degree of connection with other points (the number of members, or texts, in the neighbourhood of a text);

paths (the longer links made by a sequence of lines between points);

density (the number of lines of connection in relation to the total possible number of connections which could be made).

In addition, the concept of *inclusiveness* (the proportion of points which are included in the adjacency networks, i.e. connected by lines with other points) was used to interpret what the graphs reveal about participation as a whole group phenomenon, rather than composed of individual ‘rates’ of posting. This provided a reassessment of the significance of *sociometric stars* (points which attract a high number of directed lines) and *null points* (points which are isolated and do not connect with any other points). I had originally thought that such features would make a large contribution to understanding the relatedness between online postings, and the impact of CMC on their conceptual content. This view was revised. Graph theory enabled me to analyse that inter-relatedness between the online texts, by examining the patterns which emerged from the maps. The appearance of lines on a map led to an ‘impression’ of the textual activity within the group, but graph theory examines with consistency how the points were connected in terms of the group as a whole. It linked the individual instances of relatedness with the group capacity for relatedness, and this emphasised that textual interaction within a group learning situation can be a group

phenomenon, where some individuals may not be involved in high degrees of connection, but are part of a group which is composed of interactions with learning potentials. This is important for analysing textual relatedness because it is relevant to collective concepts of learning within communities for TPL, which have been identified in Chapter 2 (2.3.2) as important to the notion of agency (Sachs, 2003a; Lingard et al., 2003). Examining the relatedness of online texts written by teachers within the context of a masters degree aimed at professional learning, supported an analysis of how far CMC can enable the joint harnessing of ‘intellectual resources’ which Sachs (*ibid.*) argued to be at the centre of TPL to achieve agentive professional identity (see Chapter 2, 2.3.3.1).

4.2.1 Constructing the maps as an interpretive process

This section needs to be read together with the maps presented in Figures 4.1, 4.2 and 4.3 in section 4.2.2.

Constructing the maps helped to clarify that the text can be treated separately from the author in examining the relatedness between messages, even though the authors make choices about which ones to respond to, based on intellectual engagement with the content of what they read. Chapter 5 examines the *content* of the texts in detail. This chapter acts as a preliminary to that, to establish an analytical overview of the connections between the texts during the discussions. My treatment of texts and those who wrote them is rooted in the research stance towards textual material, which I have explained in Chapter 3 as being that a text is ‘filled with content’ (Kress, 2003) through the process of reading it, and that authorial intention is highly contested in contemporary hermeneutics. I rejected ego-centric mapping (Chapter 3, 3.3.3) because of its prioritising of the *person*, and constructed the maps around the responses contained within the texts instead. Bassett and O’Riordan’s (2002) assertion that an electronic text cannot be conflated with its author is a methodological underpinning of the study. This informs the mapping from the first stage of the process in which I had to consider how to treat the ‘participant’ in terms of deciding whether the maps should use *directed* or *undirected* lines between texts, and which direction should be indicated by the lines connecting texts. This is because an undirected line represents a relationship between texts which is not value-laden, i.e. they have an equal relationship of influence or function. A directed line however, represents some kind of

influence or agentive effect between one text and another. I chose directed lines, and to explain this I need to make it clear at this stage how the texts were produced.

The initial texts recorded in bold along the row ‘PARTICIPANT TASK 1-15’ were written in response to an MTeach ‘task’. They were composed as individual treatments of a theme or question and posted to the forum as email messages. After this, the teachers chose to respond to whichever of these initial texts interested them, and wrote a response. They indicated it is a response by either pressing the ‘reply’ button so that it was shown as a response to a particular message in the email subject header starting ‘Re.’, or by referring at the start of their text to the teacher who sent the original task-generated message or its topic. The message called a ‘Response’ may in fact contain several responses to the initial task-generated postings, and these responses are the core focus of the analysis – the unit. Thus there were a total of forty-five messages which are ‘Responses’ across all three discussions (forty-seven are logged in the dataset from the discussion forum, but two if these were identical messages sent in error) but they contained ninety-six separate responses to particular texts.

The importance of the direction of the lines is that they impact on representing and thus on understanding, and are part of my interpretive stance towards the text and the participant. The lines do not exist separately from the interpretive stance. They are constituted by it and contribute to it. To explain, I will work with an example from map 1 of the first discussion (Figure 4.1). An initial text is generated by a course task, for example the text produced by P1 is Participant Text 1(PT1, indicated by a bold ‘1’). It is posted to the discussion and it is recorded along the starter row from which the discussion is mapped, labelled ‘PARTICIPANT TASK 1-15’. It is responded to in messages posted by P14 and P15. I had to decide – what am I showing here? The initial text PT14 (bold 14) is not responded to by P1 so it is not a reciprocal relationship between the texts. PT1 has had an impact on PT14. But the initial text, PT14, has not impacted on P1. Therefore, a decision must be made – should there be a directional line *from* PT1 *to* the text sent in response by P14 to show it has impacted on P14 to indicate the movement of ideas and influence along a chain of texts (however small?). This is one area of social networking theory which has evolved from sociometry, to do with movement of information and ideas within a group originating in the concept of ‘contagion’ of diseases (Scott, 2000, p. 16). But, the line could also be directed

from the text elicited from P14 to PT1 to show that P14 has responded, i.e. P14 has made a choice that PT1 contains something that is provocative of further comment and is an instance of the learning potential in the contact between texts. The relationship between the two texts is not equal, and can be interpreted in either way. Using graph theory offers a way of organising the data, but the choices are made by 'I' as researcher (Schostak, 2002) according to my interpretation of the nature of the relatedness being examined.

Conventional sociometry, rooted in Moreno's seminal work (1960) would concentrate on the choices made by individuals within a group towards others in the group, and would show who was 'chosen' to respond to according to criteria. The line points from the chooser to the chosen. As such, the 'criterion' in the maps is that the participant has preferred to respond to a particular text, out of all the possible options. It is the basic form of social interaction which brings ideas together and establishes a socio-constructivist practice. So, I had the choice of using 'response' as a criterion to determine the direction of the arrows.

This was an important consideration because it reflects a rejection of deterministic, fixed concepts of teachers' knowledge. The initial text cannot have a predetermined impact. It exists for others to make it significant for themselves and respond to it. The learning potential is not predetermined and the learning involves the reader in making sense of it. Therefore my decision was to use directed lines to show that a text is chosen and its 'relatedness' is evidenced in the replies sent to it by other group members.

At the same time, the fact that choices were made means that the texts provoked and acted as agents for thinking among respondents in the group. In making a choice, meaning-making was taking place. For that to happen, I had to focus on more than a 'response' perspective centred towards individual texts and note the movement of conceptual content from an originator to other group members. This does not mean it was being 'transferred' or 'acquired' but rather it was made available for intellectual work and individual processes of meaning-making. The 'educational transaction' which Garrison and Anderson (2003) say is essential to learning in CMC is thus, in a sense, visualised in the mapping. It encapsulates what they call "the inseparability of the teaching and learning roles" of those involved, and "the importance of viewing the educative process as a unified transaction" (ibid., p. 13). Vygotskian theory of the relationship between thought and language can be

applied here, to how this educational transaction can be viewed through the maps. *Choices* depend on readers making sense of the ideas they read. Choices are rooted in the formulation of concepts related to the content of the texts. Conceptual work is rooted in both the teachers' individual understanding of words in texts which act as signifiers, and the modifications of those ideas brought about by 'filling with meaning' the content of the texts. By downward branching mapping, I have been able to treat the task-generated texts as the roots of a dynamic text-centred practice involving meaning-making. This further dynamic is shown because I am also interested in impact. My decision to show the branching pattern of response to 'root' texts reflects ideas from social network theory, a sociological field which has developed in its own right and which draws on concepts derived from sociometry. Social network analysis focuses on the patterns of connections in a network as a whole, and tells more about the relatedness within points in a community than examining individuals as focal points within that community (Diani, 2000). Several aspects of social network theory are not relevant to this study because they focus on the dynamics of large organisations or political movements (Diani and McAdam, 2003) and most of all issues of recruitment, membership and function within unbounded communities united by belief systems, such as environmental groups. What is helpful though, is the emphasis which social network theory places on the overall pattern of connections which constitute the way a collection of individuals is bound, in which an emphasis on analysis of personal networks is not a priority.

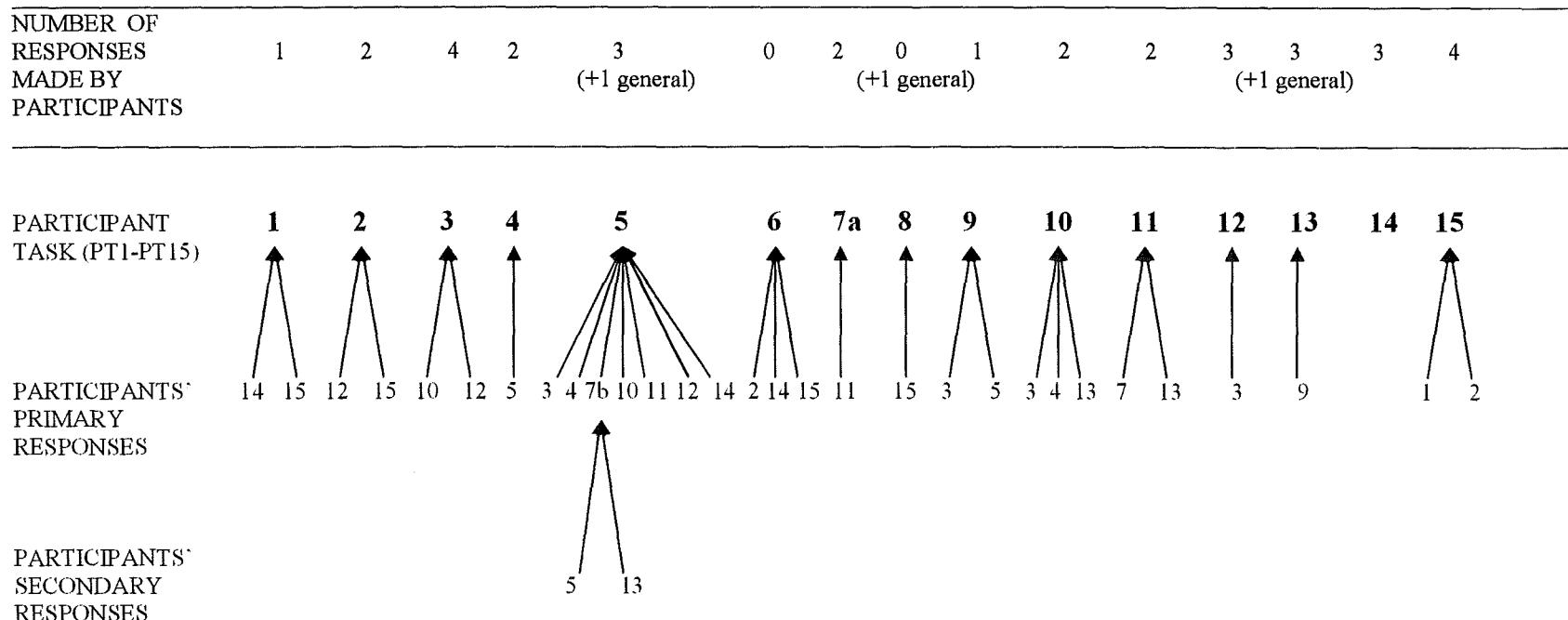
I therefore show two facets of the same constructivist phenomenon – responses within texts as evidence of conceptual work evidenced as choices, and texts as sources of meaning-making. Relatedness exists as an observable socio-interactive practice. It is also the result of conceptual work, which results in choices being made. I have not mapped the 'transfer' or 'passing on' of knowledge, but mapped responses which cannot exist without a co-dynamic – the flow of ideas within the educational transaction. The two dynamics co-exist and are inter-dependent but not reciprocal or equal – they are different facets of an intellectual engagement, and both of them can be 'read' from the maps, but they are not interchangeable, and thus the lines only point in one direction. The flow of ideas is not the same as knowledge transfer, which is not conceptually compatible with the theoretical analysis of TPL explored in Chapter 2. Each teacher needed to remake and construct knowledge as a result of interacting with the ideas of others – it was not 'handed down' and

the lines cannot point from a text towards the respondents. Thus the directed lines formed an attempt to capture and represent the basis of the social construction of knowledge in the textual practice of CMC. The importance of inter-relatedness for the social construction of ideas by the group became clearer, but needed further identification of what textual inter-relatedness *is* as captured by the maps. This was explored by examining four sociometric concepts of ‘paths’, ‘neighbourhoods’, ‘inclusiveness’ and ‘density’ which have helped to constitute inter-relatedness in a way that helps contribute to understanding how CMC impacts on TPL within the case context.

Before examining these concepts, a step in sociometric analysis required the construction of adjacency matrices which provided a statistical rendering of the patterns established by the lines on the maps.

4.2.2 The maps

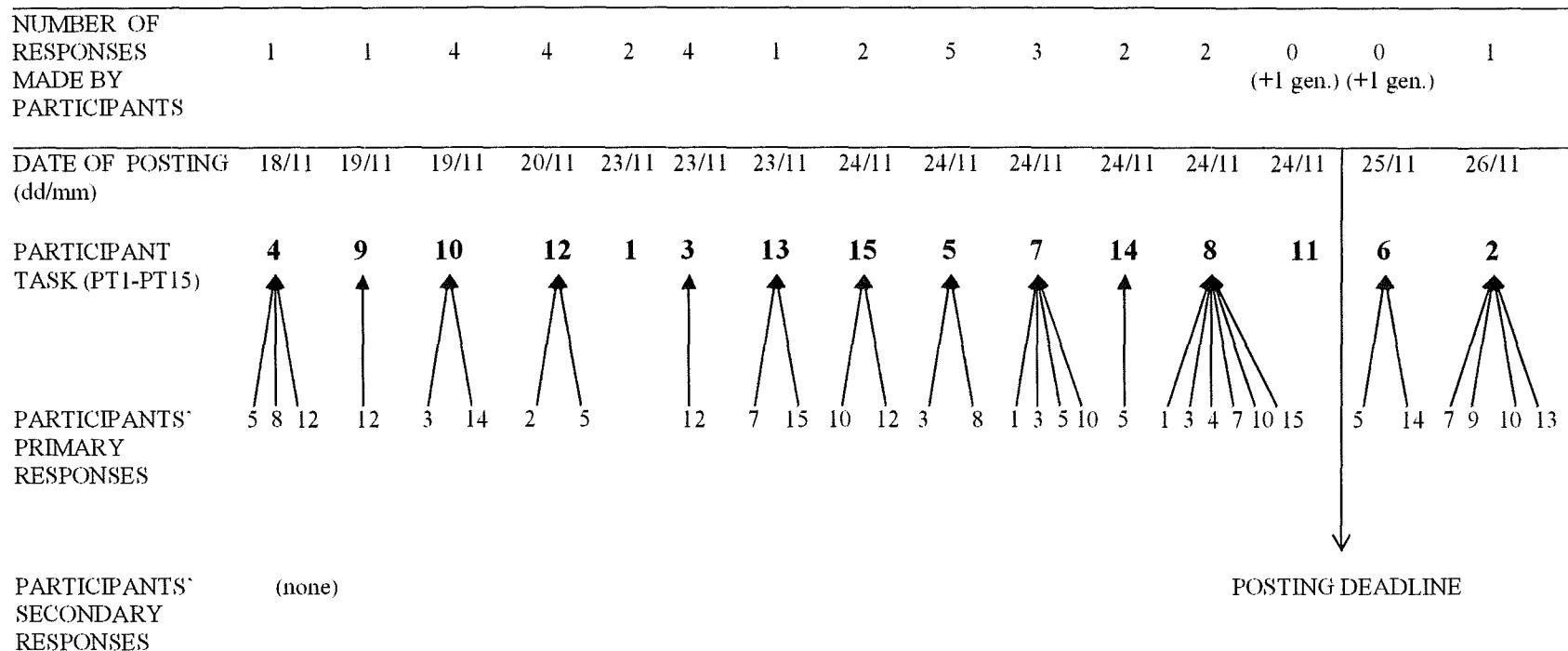
Research and Professional Practice online discussion 1: the value of educational research to the practitioner



Total number of lines: 32 to specific messages (+ 3 general responses to the discussion)

Figure 4.1 Map 1: MTeach tutor group online discussion 1, mapped by participants (1-15)

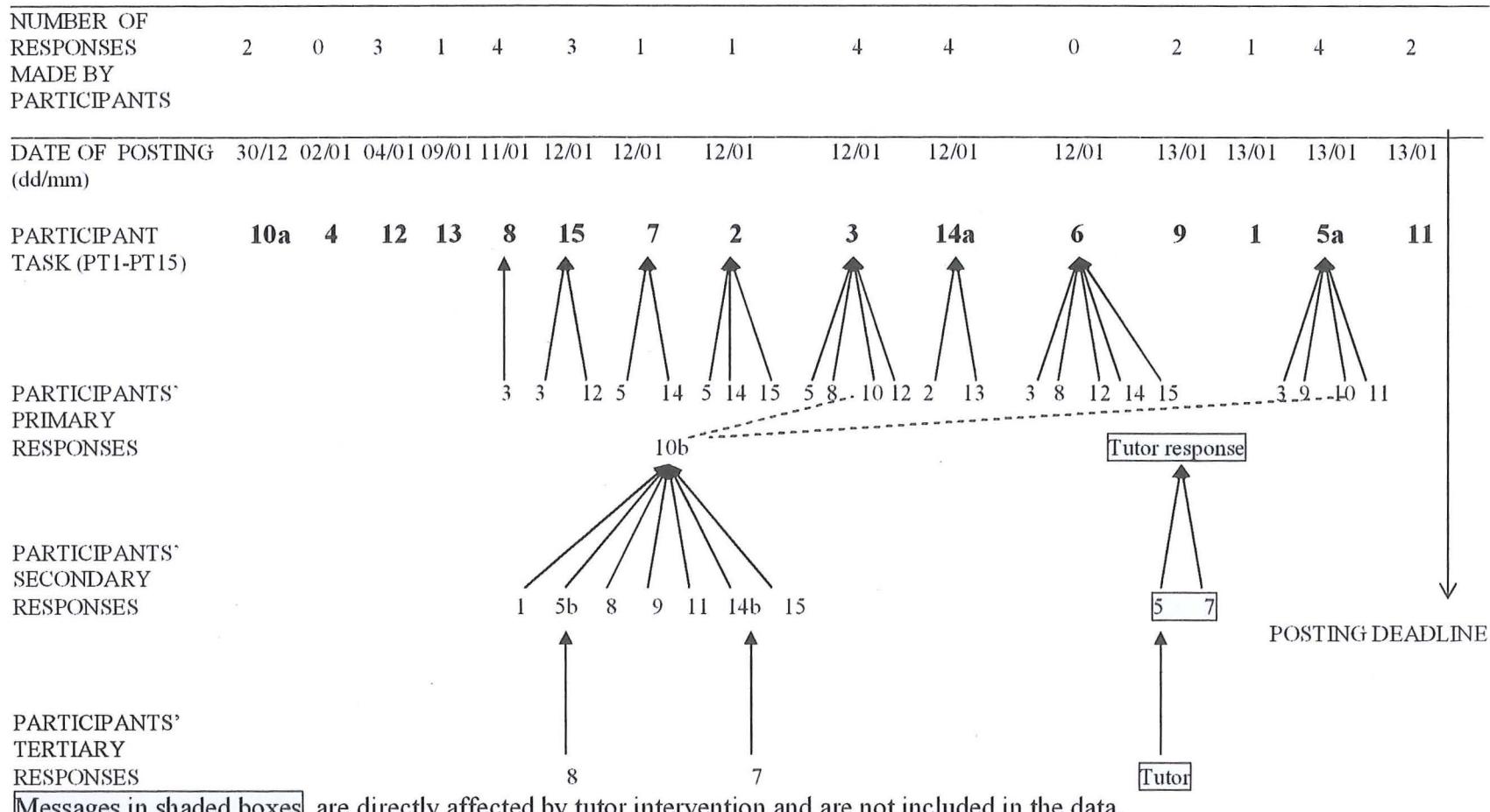
Research and Professional Practice online discussion 2: what is good educational research?



Total number of lines: 32 (+ 2 general responses to the discussion)

Figure 4.2 Map 2: MTeach tutor group online discussion 2, mapped by date of initial task posting

Research and Professional Practice online discussion 3: why do teachers need to be research literate?



Total number of lines: 32.

4.2.3 Constructing the matrices

This section refers to the matrix for map 1, presented in Table 4.1, and the two matrices for maps 2 and 3, contained in Appendix IV for further reference.

Graph theory uses matrices to understand the relatedness of lines on a graph. The number of lines directed towards and away from every point is counted and entered in rows and columns. They are ‘adjacency matrices’ because they are built around the basic relationship at the core of sociometry – the adjacency, or connection, between pairs of points in a map or sociogram. The rows record each time each individual text received a response, and the total number of responses for each text is recorded in the final column. The columns record each time each participant responded to a text by including a response in a new message, and the total number of responses sent is recorded in the final row.

The final column of each matrix therefore shows the total number of lines directed towards each point, or which it ‘receives’, which is called the ‘indegree’. It is here that the patterns shown in the maps appear as numbers. For example a ‘7’ in the final column of a matrix means that a text has received 7 lines or responses. 7 was the highest number of lines directed to any point in the discussions so these would show as a ‘sociometric star’ on the map. For example, this is shown in the matrix for map 1, for the text PT5 (see Table 4.1). A ‘0’ in the final column means a text has received no lines and is a ‘null’ point.

The final row of a matrix shows the total number of points which each point connects with by pointing towards them, which is called the ‘outdegree’. This indicates how ‘active’ participants are in sending responses to others, and shows for example that P6 is consistently a non-participant in the discussions as the column entry for P6 is ‘0’ in the matrices for all the maps.

The totals for the final column and final row should be identical and equal the number of lines on the map, showing the total number of responses sent after the text-generated postings, which is 32. The matrices, as in the example from map 1 given in Table 4.1,

record all the directed lines contained in each map, and indicate in addition if they are secondary or tertiary level responses, meaning they are responses to responses, not to the root task-generated texts:

- s: indicates a secondary response
- t: indicates a tertiary response.

It was important to indicate that some of the lines were drawn to show secondary and tertiary responses, because some of the calculations are based on showing how many lines a particular text received, whereas others need to calculate the total number of lines in the maps. For the former, the distinction between primary, secondary and tertiary level responses is therefore important, as a number of responses can be elicited by a participant via different texts they have written. Where a participant writes more than one text which receives responses, these texts are entered on the matrix using letters to distinguish them. This is important because it is not the teacher (who would obviously be the same point) receiving the lines, but the text. For example, in map 1 (Figure 4.1), P7 has written a task-generated text, recorded as 7a on the starter row, but a further text, 7b, is also recorded in the primary responses row. This is to distinguish more than one text written by P7 which has received responses. The point 7b is thus both a response and an agent for further responses. 7b has written two texts which have elicited responses, and these have to be distinguished for some of the calculations. They are recorded in Table 4.1. The matrix column total appears as $1 + 2s = 3$, to show the total of 3 lines received must be treated as 1 + 2 to properly represent the map – otherwise it could be mistaken that P7 has written a single text which is connected to 3 points. The figures must always relate to the texts produced, not their authors.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Indegree (Total lines received)
1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
2	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	2
3	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2
4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
5	0	0	1	1	0	1	0	0	1	1	1	0	1	0	0	7
6	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	3
7	0	0	0	0	1s	0	0	0	0	1	0	1s	0	0	0	1+2s(=3)
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
9	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
10	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	3
11	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2
12	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
13	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Outdegree (Total lines sent)	1	2	4	3	3	0	1	0	1	2	2	3	3	3	4	32

Table 4.1 Adjacency matrix for map 1

I used the matrices to establish patterns of overall textual inter-relatedness from a socio-centric perspective. It is also possible to use the matrices to find out exact relationships between individuals – for example I could analyse the socio-dynamics of the group, by identifying which individuals never or always responded to particular peers, and if some trends appear between individuals or neighbourhoods establishing a clique. Such a sociological perspective would be closer to the origins of sociometry, in an ego-centred linking of individuals to their social contexts, but not to my adaptation of it to text-based CMC which takes a different stance towards the use of sociometric data which is based on social networking.

In constructing the matrices, a further clarification was needed around ‘general’ responses where teachers (e.g. P5, P8, P13 in map 1, Figure 4.1) wrote a text referring generally to what had been said in the group, but did not indicate any particular text which had prompted their writing. I recorded general responses along the top row of each map

(labelled NUMBER OF RESPONSES MADE BY PARTICIPANTS), but I could not draw a line of connection – it would have meant connecting a ‘general response’ with every other text that appeared in the discussion up to that point. This is a potential anomaly in the data. I did not include general responses in the adjacency matrices, as to record a general response as a response sent to everyone would distort the statistical analyses more than leaving it out. Thus I have to make it clear that the analysis is based on all the *directed lines* on the map, and cannot take account of undirected responses. This means that P6 appears within the matrices to have made no responses, thus making him a non-participant who makes no contribution to textual inter-relatedness, when in fact he did write one general response. This is something I acknowledge in the analysis. For the case, interpretation must be driven by meaningful contextualisation and use of the data to develop understanding of CMC and TPL. I had to use judgement about whether a message was a general response and could not be called a response to a particular text. I have had to use judgement in interpreting the relationship of one text to another, and in deciding how many responses are contained in a message, before mapping them and entering them on the matrix, based on knowing the material thoroughly and interpreting the focus of the message.

The fact that I acted as the single ‘rater’ in making these judgements is part of the development of the case as one involving my own learning. This is core to my relationship with the research as involving ‘inquiry as stance’ (Cochran-Smith, 2003) and the learning dimensions which are an explicit aspect of the case development. I have not used statistics to present ‘truth’, but to assist my learning about the phenomenon, in order to develop an informed and relevant methodology, and enhance my understanding of the complexity of what is involved. It is almost certain that a different individual would draw a different map. A map, as an analytical diagram, is as much an analytical diagram of my stance towards the material as it is of the material itself. I have already transformed the material by presenting it in this way –‘recontextualised’ it (Brown and Dowling, 1998) and part of this recontextualising involves the impact of my own conceptual orientation towards meaning-making in CMC and TPL. This is an explicit part of the case development – the maps reveal ‘what I see’, rather than ‘what is there’ in an absolute sense, and I acknowledge the maps as representing unpredictable social phenomena which are produced by humans.

Thus, I have logged the small number of ‘general’ responses (3 for discussion 1 and 2 for discussion 2) at the top of the maps to acknowledge their presence, but not mapped them, as the impact of mapping them to every possible text would have a greater distortion on the data than leaving them out. It shows the limitations of the method, but my adaptation of sociometric approaches is not intended to deal with exceptions and the nuances which result – it is a preliminary method of organising data in order to understand it, and specifically to understand how the postings can contain community dimensions which can constitute conceptual work. A different and contrasting perspective is adopted in the considerable attention to the detailed content of the participants’ texts, using QCA, in Chapter 5.

4.2.4 Analysis of ‘outdegree’ as a measure of participation

It is a coincidence that all three matrices added up to 32 incidents of adjacency, meaning that there are 32 lines on every map connecting pairs of points. This was completely unexpected as the ‘feel’ of the maps is quite different from one another. It shows how the level of relatedness within a discussion can be similar – even identical in some respects – despite widely varying amounts of ‘null’ and ‘star’-centred activity. Discussions 1, 2 and 3 have 1, 2 and 7 null points respectively, and 1, 0 and 1 sociometric stars, using ‘7’ as the highest level of outdegree in the discussions as a benchmark for this. It is hard to tell how inter-related the maps are by looking at patterns which stand out visually from them. Inter-relatedness requires mathematical calculation across the wider patterns of the group, and this resulted in a reinterpretation of my initial impressions of the discussions as not very interactive. It prompted a reassessment of what ‘interactivity’ actually means, and how it is represented. In turn, this has significance for my developing understanding of the complexity of analysing the discussions in terms of ‘joint thinking’ and ‘community’ dimensions.

The coincidence of 32 lines in each map has an impact on the subsequent manipulation of the data. It is anomalous to have this degree of consistency in the lines recorded across all three matrices. The source of this anomaly is in the consistency of ‘outdegree’. In online

discussion, the number of responses sent will determine the number of responses received across the discussion as a whole, even though there may be wide variations in the number of individuals who receive responses. On reflection, the consistency of outdegree is not so surprising in that responding to at least one task-generated task is a requirement of the course but, even so, individual participants varied considerably in adhering to this – one response is compulsory, but participants are free to choose how much they contribute beyond that.

Below is the table of total ‘outdegree’ rates across the three discussions, which is compiled from the final rows of each matrix. From these rows, the average outdegree per participant across the three discussions is calculated by using the totals of their adjacency columns from the three discussions.

Participant	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discussion 1	1	2	4	3	3	0	1	0	1	2	2	3	3	3	4
Discussion 2	2	1	4	1	5	0	3	2	1	4	0	4	1	2	2
Discussion 3	1	1	4	0	4	0	1	4	2	2	2	3	1	4	3
Average outdegree	1.3	1.3	4	1.3	4	0	1.6	2	1.3	2.6	1.3	3.3	1.6	3	3

Table 4.2 Outdegree in the three discussions

In discussion 3, participants 4 and 6 did not respond at all, while 4 participants each had an outdegree of 4, contributing 16 responses and thus accounting for 50% of the total response in the discussion. It cannot be argued that these four account in a consistently disproportionate way for overall levels of response within the group as a whole however, because in discussion 1 their total outdegree is just 10 (31.25% of the total for the group), and in discussion 2, it is 13 (40.63%). The overall consistency in the group producing 32 responses, given variation like this among its chief contributors, indicates an overall norm in the discussions which lies outside of individual-focused networks. It points to the effects of the group operating as a culture, by which it establishes ways of working and ‘being’ as a whole which does not depend on individuals. There is a consistency in the group

experience around textual exchange. A sense of what is ‘normal’ emerges from such a consistent pattern, despite individual instances of being highly active (an outdegree of 4) or non-participatory (an outdegree of 0). The participants experience this online discussion in terms of there being 32 responses. The balance of their widely differing response patterns together constitutes the interactive context of the discussions. Context-making was established in Chapter 2 as a core aspect of CMC as a socio-interactive practice, making it essentially agentive. It involves members of a community in creating the conditions for their own participation, and determining the nature of practice among members. The outdegree patterns in this group suggest a form of context-making is present. This suggests that the existence of context-making is something which can be established from statistical patterns because they indicate the operation of the group as involved in steering aspects of its own practice. Here, this means shaping the overall pattern of its own engagement with texts. This does not mean everyone participates in the same ways – the table above shows that variation is widely distributed across the group. It means that the group settles around an inexplicit and unofficial norm of inter-relatedness between texts as a whole.

Chapter 2 considered the implication of viewing community within CMC as ‘what people do together’ (Jones, 2002). The argument is that context in text-based CMC is made up of the ‘models’ that people build up in their minds and in their interaction of the situation. They construct knowledge – or ‘models’ and use these models to make predictions about the kinds of behaviours which will show them to be ‘competent’ members of particular communities. Mapping of the discussions suggests that such a model for the group’s participation in the discussions as a whole is built up by the teachers, and that it is self-regulating. This is important for considering tutor non-intervention in the discussions. As the tutor, I could have impacted on the matrices, by eliciting postings from individuals, drawing attention to particular texts, and writing to provoke response or argument between participants. Any of these would impact on context-creation, and according to Lea (2000) would exercise disproportionate influence on the way the discussion developed in participants’ concerns to perform in ways they think I wanted. Map 3 (Figure 4.3) records where I did intervene in this discussion, against my usual approach, and I chose to exclude the results of that from the data, as I interpret my intervention as introducing tutor-impact to

the inter-relatedness of the texts. It is coincidence that, with the lines created by my ‘intervention’ removed from the data, the total number of lines again equals 32 (I made the decision to exclude the texts prior to calculating the total). With such a small sample, I cannot over-interpret the consistency of the total number of lines per discussion, but it is indicative of the tacit group control over the way they practice CMC. There is a suggestion here of context-making that confers an agentive dimension to the process. It confirms that any learning potential of the text-based discussions is linked to the abilities to make choices and to tacitly regulate the discussion, in which there are allowances for varying degrees of participation, including ‘null’ points.

4.2.5 Paths

Points which are indirectly connected by a sequence of lines are called ‘paths’ and they are a measure of indirect relatedness in graph theory. A walk is a collection of lines which are indirectly connected to the initial point, and may contain several paths. Paths as a concept can help consider ‘interactivity’ as a feature of learning in CMC, but relate more to theories which are based on frequency of back-and-forth responses or threads of conversation. In this respect, the paths featured in the discussions record have low levels of relatedness *and* interactivity. There were a limited number of paths, and they were all based around one central agentive text which triggered responses beyond a primary level. There are 2 paths in map 1, which share a ‘walk’ of 3 lines directed towards text PT5, 0 in map 2, and a total of 14 paths in map 3, which share 9 lines of the two walks of 10 lines, one directed towards text PT3, and the other to text PT5a.

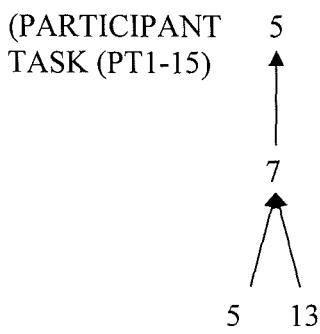


Figure 4.4 Paths (2) in map 1

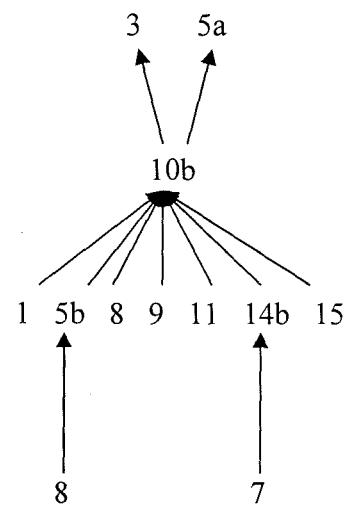


Figure 4.5 Paths (14) in map 3

The high number of paths in map 3 is accounted for because the points share a ‘walk’ directed towards two Participant Tasks, 3 and 5a. A combined response to both of them (10b) triggered 7 secondary responses, and then 2 of these (5b and 14b) triggered a tertiary response. The paths in map 1 both have a length of 2, which means they are made up of 2 lines. In map 1, the paths are 5-7-5 and 13-7-5, so the text posted by P7 acts as the agentive mid-point in both. In map 3, 14 paths are linked by one point, 10b. 4 of these have a length of 3 (8-5b-10b-3, 8-5b-10b-5a, 7-14b-10b-3, 7-14b-10b-5), and the remaining 10 paths have a length of 2 (1-10b-3, 8-10b-3, 9-10b-3, 11-10b-3, 15-10b-3, 1-10b-5a, 8-10b-5a, 9-10b-5a, 11-10b-5a, 15-10b-5a). In summary, the paths are not widely distributed among the responses, and only 4 paths are of more than a minimum length of 2. This raises two issues for the case, one related to the concept of ‘joint thinking’ in CMC and TPL, and other to methodology, and they are fundamentally linked.

Joint thinking has been identified as a key concept in socio-cultural perspectives on learning with CMC and in TPL. Knowledge is constructed by the shared negotiation of meaning through ‘scaffolding’ processes, involving the internalisation of ideas through exploring them with others, by literate processes which conduct questioning, modifying, suggesting, linking with further ideas etc. Face to face talk is the original context for this learning theory, and it has been transposed to CMC by adaptation based on the notion of

email as a ‘hybrid’ form of literate practice, involving talking and writing (Baron, 2000) (Chapter 2, 2.2.2). The paths suggest that joint thinking may be difficult to observe in terms of it being developed within an iterative conversation between learners involving scaffolding strategies. There is very little conversational interaction in such limited paths. Only 5-7-5 in map 1 and 5b-10b-5a in map 3 represent a conversational pattern based on turn-taking between participants.

Linked to the issue of ‘joint thinking’ raised by limited paths in the maps, is the need for an appropriate methodology for textual analysis which addresses social presence in the construction of meaning. The methodology will not be relevant if it is based on methods which seek to ‘track’ conceptual change (Lapadat, 2000) by spotting features over iterative online ‘conversations’, or in the weaving of discourse (Feenberg, 1989) or in ‘concept mapping’ Turoff et al., (1999) over chains of messages which form ‘threads’. This preliminary sociometric data contributed to the decision to explore and develop a method of textual analysis which needs to address the content of what is written and establish its relatedness to other texts, without it being dependent on counting or tracking an intellectual ‘trace’ within a notion of ‘discussion’ as being like face to face ‘conversation’. These messages are not a substitute form of the dynamics of face to face conversation. Garrison and Anderson’s (2003) conceptualisation of ‘social presence’ in QCA has offered the kind of adaptation that is needed. It focuses on the *quality* of content which constitutes socially binding material, rather than frequency of indicators. Their definition of social presence which supports conceptual work develops beyond the first need for participants to “project themselves socially and emotionally as ‘real’ people” (p. 49) to “creating a climate that supports and encourages probing questions, scepticism and the contribution of more explanatory ideas” (p. 50). They warn that “there may be an optimal level of social presence” (p. 53) and that it is the relationship between different types of presence that makes an effective online learning community. There is no fixed ‘type’ of pattern of interaction which constitutes this, but it does require close attention to the qualitative content of what is written within the community to identify if a ‘climate’ indicating social presence exists.

4.2.6 Neighbourhoods

The downward-branching structure of the maps shows the flow of ideas or concepts throughout the group, in ‘neighbourhoods’. Neighbourhoods are a measure of inter-relatedness. A neighbourhood is a group of all the responses which are connected to one text by a directional line and is represented in a map through the cluster of lines (or just one line) connecting to one point. The number of lines is the size of the neighbourhood of the point. Sometimes participants produce several neighbourhoods, when they post more than one text which receives a response. This is when a neighbourhood composed of ‘secondary’ or ‘tertiary’ responses has formed around primary level responses to a task-generated task. Neighbourhoods are shown in the matrices by the totals for each row which are in the final column. Each neighbourhood can be a different size, which is called its ‘degree’. In directional maps, the ‘indegree’ of a point is the number of lines pointing towards it. The neighbourhoods in the maps are based on indegree, reflecting my decision to focus on the ‘response’ as the unit of analysis. An ego-centric map would have produced different neighbourhoods, based on all the connections linking a teacher with other texts, or just the ones they chose to respond to. Either way, an ego-centric approach would have reflected ‘outdegree’ in the maps themselves. Outdegree is obviously recorded in the adjacency matrices, since it is one half of a pair connected by a line, but it is an ego-centric measure and is not the concept used to structure the maps. The neighbourhoods in the maps reflect my stance as researcher, and result in measures of ‘indegree’ being visible as well as achieved by calculation. The indegree of the neighbourhoods is thus a socio-centric measure of relatedness of texts across the discussion as a whole.

Those who share a neighbourhood are not necessarily sharing an interpretation or valuing the original text in equal ways – they will be read according to the ‘contemporariness’ of policy and practice in TPL and the teachers’ personal histories, combining individual and social factors which affect meaning. That is a different part of the case – and is the basis for a qualitative analysis of the messages containing responses (Chapter 5) and of the interviews with teachers (Chapter 6).

The table below shows the indegree ratings for discussions 1, 2 and 3. For example, discussion 1 has a total of 15 neighbourhoods, and the column shows how many there are with an indegree rating ranging between 7 and 1. The fifth column (shaded) shows the total number of neighbourhoods having an indegree rating between 7 and 1 for all the discussions. Multiplying the indegree rating by the number of neighbourhoods in a discussion gives a total of 32, which is the total number of lines for that discussion. Because of the anomaly that all the maps have 32 lines, this total figure is the same for each column.

The fifth column then shows the total number of neighbourhoods which share indegree ratings of between 7 and 1 across all three discussions. The total at the bottom of 39 is therefore the total amount of all the neighbourhoods that exist across the discussions, and which all the participants were part of at some stage except for P6, who did not respond to a particular text in any discussion as he only made one general response.

Indegree rating	No. of neighbourhoods (Discussion 1)	No. of neighbourhoods (Discussion 2)	No. of neighbourhoods (Discussion 3)	Total no. of neighbourhoods	% chance rounded to 2 d.p.
7 ('stars')	1	0	1	2	5.13
6	0	1	0	1	2.56
5	0	0	1	1	2.56
4	0	2	2	4	10.26
3	2	1	1	4	10.26
2	7	6	3	16	41.03
1	5	3	3	11	28.21
Total no. of neighbourhoods per discussion	15	13	11	39	
Indegree x neighbourhoods = 32	1x7 + 2x3 + 7x2 + 5x1 = 32	1x6 + 2x4 + 1x3 + 6x2 + 3x1 = 32	1x7 + 1x5 + 2x4 + 1x3 + 3x2 + 3x1 = 32		100

Table 4.3 The 'indegree' measure of the neighbourhoods in the three discussions

The table shows that across the three discussions, the outstanding trend is for neighbourhoods with an indegree of 2 which occurs 16 times, followed by those with an indegree of 1 which occurs 11 times. This confirms what can be seen impressionistically by the lines on the maps. The size of indegree in neighbourhoods is low, and the incidence of neighbourhoods with an indegree of more than 2 is low. The final percentage column shows the percentage chance of a text being in a neighbourhood of 7 – 1 across all three discussions. It is clear that the discussions are comprised of mostly small neighbourhoods, with only 10.25% of them having an indegree of between 5 – 7. The vast majority (69.24%) of responses are in neighbourhoods of only 1 or 2. This analysis is consistent with the examination of paths, in that joint thinking in this study needs to be addressed in terms of conceptual activity brought about by conditions in the group overall, rather than multiple exchanges between ‘correspondents’, and that there are implications for methodology in organising the postings as data and carrying out analysis of their content.

4.2.7 Inclusiveness

The concept of ‘inclusiveness’ offers a contrasting interpretation of the data and supports a view of joint thinking as possible within an overall practice rather than centred around back-and-forth exchange between individuals. Inclusiveness expresses the number of points which are connected with other points as a proportion of the potential number if there were no isolated points. It is expressed as a proportion showing how many of the points are included in the adjacency networks, where a graph with every point included and no null points would be 1. A measure of inclusiveness is “the number of connected points expressed as a proportion of the total number of points” (Scott, p. 73). For the case, the relevance of inclusiveness is based on finding out how inclusive the practice is of responding to participants’ texts. I am calculating inclusiveness based on the points shown on the maps, i.e. based on total indegree triggered by participant tasks. Inclusiveness therefore refers to all of the points expressed as a proportion of the potential number if there were no texts which received no responses. This means I include the task-generated tasks which feature as null points on the maps.

	Null points (based on indegree)	Points – isolated points	Inclusiveness of maps
Map 1	1	$47 - 1 = 46$	0.98
Map 2	2	$47 - 2 = 45$	0.96
Map 3	7	$47 - 7 = 40$	0.85
Average inclusiveness of the maps:			0.93

Table 4.4 Inclusiveness of the maps based on indegree

The maps have consistently high levels of inclusiveness, resulting in a high overall proportion of inclusiveness of 0.93. No one remains a ‘null point’ for every discussion, i.e. every participant has written a text which received a response. This is not catered for in the course guidelines, as participants are free to choose which texts to respond to. Considering the low levels of interaction and limited paths, this is significant. In a context where there is tacit regulation of how much participation will take place overall, the tendency towards smaller neighbourhoods ensures that there is more inclusiveness. Where the responses are distributed more widely across the participant texts (discussions 1 and 2), there are fewer null points (1 and 2 respectively) than in discussion 3 with neighbourhoods with a higher indegree, but which also has 7 null points. The greater the indegree of the neighbourhoods, the more null points in a discussion where the participation rate averages at 2.1 over the three discussions. A higher outdegree rate would enable both neighbourhoods with high indegree *and* few null points to exist. The participation rate in this group however could not support this. Outdegree is more distributed than clustered, and exists within the bounds of participation which the participants have established for themselves. This means that a particular form of inter-relatedness develops, where inclusiveness is high, but sustained threads do not develop. It can be interpreted that a more democratic and distributed kind of engagement is developed here. A qualitative analysis is needed to explore whether the concentration of focus on texts within smaller neighbourhoods results in deep levels of conceptual work, or whether conceptual presence is limited, and the texts lack sustained engagement with ideas achieved through multiple exchange.

4.2.8 Density

Inclusiveness then, is based on knowing the *least* connected points in a map and using that to determine a measure of inter-relatedness. *Density* works from the opposite premise. It seeks to know the maximum amount of connection a map could potentially have in order to describe the general level of connectedness in a graph. Density is expressed as the actual amount of lines in a map as a proportion of the maximum possible amount of lines which could be present, and uses that to work out how connected it actually is. Density is based on a mathematical calculation showing how far the map or graph is ‘complete’. A complete graph, theoretically, is one where all the lines are connected to every possible point. “Such completion is very rare...and the concept of density is an attempt to summarise the overall distribution of lines to measure how far from this state of completion the graph is. The more points that are connected to one another, the more complete the graph will be” (Scott, 2000, p. 73). ‘Completeness’ should not be mistaken as a desirable goal – it is a mathematical concept to gauge the state of inter-relatedness between the teachers’ texts. It is a theoretical way of understanding graphs for how ‘inter-related’ its components are.

Judging the ‘completeness’ of the maps was the next context-specific challenge. The conditions which would make a map ‘complete’ are not determined by pre-existing parameters in this context. My calculation was based on everyone responding to everyone’s initial task at the primary level, i.e. making one response. This would require each individual in making 14 responses. This was my choice – since new students often ask if they are meant to reply to everyone, it seemed the most context-relevant boundary to impose on the calculations. If each person in the group of fifteen responded to each other person just once, a ‘complete’ graph would be calculated as follows:

where $n = 15$ for the calculation $n(n - 1)$ total = 210.

Thus a ‘complete’ graph in this sense would consist of 210 lines. The density of the graph is then expressed as the *actual number of lines* as a proportion of this *maximum possible*

number of lines. Because of the anomaly that each discussion had 32 lines, the calculation is the same for each map and the density of the graphs is the same:

32 expressed as a proportion of 210 = 0.15.

The density figure is low, which is consistent with the analysis of paths, neighbourhood and outdegree. This is not a group with high levels of interactivity. Real world knowledge must be brought to this scenario however, and awareness that in reality, participants are not likely to respond to every task-generated text. Density is a hypothetical measure. This is a caveat acknowledged in social network theory (Mayhew and Levinger, 1976) because there are limits on the time and effort which individuals can devote to maintaining participation networks. This overall low density incorporates the variation between individual participant rates (outdegree) and a wide variation in the number of texts which receive a response, e.g. text 10b in discussion 3. Even discussion 3, containing 7 null points, still had the same number of lines because some texts, e.g. 10b, attracted a high number of responses. It is possible to conjecture however, that the number of null points increased because texts with a high indegree transferred attention and concentrated the efforts of the group and that there was thus a transference of focus to certain texts. The null points ensured that the cultural 'norm' within the group is maintained at response levels of 32. Therefore context-making processes may account for the non-impact of a variation in null points on density, by which the group maintained its overall degree of relatedness.

'Density' prioritises the whole of the network as the context for understanding relatedness, rather than individual interactions, which can be extremely varied. It thus establishes a link between individual levels of textual interaction, however varied, and the wider communal participation in texts which constitutes interactive practice in online discussion.

4.3 Analytical overview

The analysis has reflected the 'socio-centric' approach instigated by Barnes (1974) who claimed that social network analysis should develop as a particular application of

sociometry, and focus on the connections made in the whole of the network, not on seeing particular individuals as ‘social agents’. The patterns within the whole network are a focus for analysis, not those around individuals and their neighbourhoods of connected points. This was helpful for me in understanding the process of thinking in terms of ‘relatedness’ and what it really means in the contexts of teachers interacting with texts to learn. I would revise my use of the term ‘exchange’ as I no longer think they *exchange*. *Interaction* is also problematic as the density is low and there is relatively little movement back and forth and little evidence of conversational response patterns. What there is however, is a shift to the importance of the network itself as affecting learning. Scott (2000) argues that, in using sociometry applied to the field of social networks, “the power of a network over its members is not mediated only through their direct links. It is the concatenation of indirect linkages, through a configuration of properties that exist independently of particular agents, that should be at the centre of attention” (p. 75).

According to this, my resistance at the beginning to ego-centric network mapping and focus on the response as the unit of analysis was appropriate for beginning the case. By adopting a different approach to trying to see the whole of the inter-relatedness of the texts, I was beginning to identify what I now interpret as the ‘concatenation of indirect linkages’ which are important to the study of TPL. Community perspectives of TPL are centred on the establishment of “respect, mutuality and communication” (Sachs, 2003a, p. 135) within communities of practice which allow “participants to negotiate the appropriateness of what they do” (Wenger, 1998, p. 81). The socio-centric core of this concept of TPL can be identified in the ‘linkages’ which can be identified in the maps from the discussions. These links though, are not necessarily in the form of direct links forming a chain of thinking developed from message to message. It is *participation* in communities where practice is talked about that makes processes of meaning-making possible. This is why ‘conceptual tracking’ is not appropriate – the chronological ‘track’ of a thought through various stages of engagement in a group may be extremely elusive and, where it can be identified, it may not be the most relevant type of intellectual activity that is going on in a learning-focused community. It relies on each member being in direct contact with the idea, rather than each member making meaning by drawing on the intellectual resources of the situation, or

context. This perspective helps to consider how texts can be viewed within an examination of their effects within an interactive learning practice which is a social network. It argues that examining individual whole texts may be of limited value in terms of understanding learning as a collaborative phenomenon, which is prioritised in agentive theories of TPL. This is so even if these texts have a high impact indicated by ‘sociometric stars’.

Koschmann’s (2003) social practice perspective on argumentation in online discussion as *a way of engaging* is relevant to this analysis. This is because ‘a way of engaging’ prioritises ‘argumentation’ not as iterative position-based discourse, and views learning not as a psychological phenomenon, but as a social one “involving transformations in community membership and social identity” which has ‘distributed cognition’ at its core (p. 264). These concepts have a correlation with the maps as analytical diagrams, in which it is possible to interpret ‘engagement’ in distributed and connected terms, rather than interactive.

At this stage, the case has established that CMC as a practice in this group of teachers has low density, and that there is not a high level of exchange in terms of multiple postings between people and that this is commensurate with outdegree rates which are 2.1 on average. A picture emerges of a particular type of CMC practice in which teachers pay attention mostly to a small number of texts written by other participants. The practice distributes attention to texts fairly evenly within the group and accommodates both ‘null’ texts and ‘stars’ in a high rate of inclusiveness. The picture emerges of a practice which can accommodate these differences within an overall consistency or culture based on an expected number of postings which makes a discussion overall. There does not appear to be a sequence of sustained exchange between participants, and argumentation levels in the sense of being developed between adversarial correspondents are low. Intra-textual exploration will be important. My stance is not to investigate participation rates (as either indegree, outdegree or a combination of both) as indicators of learning – which confirms the critical treatment of these in Chapter 2.

4.4 Evaluation of using graph theory for developing the case

Graph theory has allowed me to examine the patterns in CMC as a practice based on the inter-relatedness of texts. It has been important in constituting the data and shaping the way it can be presented according to the judgements which I must make as researcher throughout the process of constructing the graphs and the matrices, before analysis of textual content and teachers' perspectives on this begins. Thus it is an analytical tool in terms of creating the data and involving me in reading and interpreting the significance of each text as a social phenomenon, before I interpret it in terms of conceptual content. The case is thus steered by my stance towards the texts as a key part of a learning practice which is socially binding and in which individuals are part of a larger dynamic which determines inter-relatedness.

There were limitations of using graph theory for this context, and in 'critical borrowing' there will inevitably be problems where elements are less adaptable, particularly in the use of statistics which assume certain norms and consistencies as a premise for calculation, which do not exist in this social context. The limitations centred on the fact that graph theory is based on the principle of *choosing just one* preference or selecting just one person from criteria to connect points on a graph. A bounded statistical premise underpins this, that there is a finite number of lines which can be drawn to express the preferences within any group, determined by the number of members in the group. Thus, for graph theory to work fully, the group size determines both the potential maximum number of points and the potential maximum number of lines in a sociogram. Problems arose from this as a premise in issues related to the specificity of the context:

1. general responses could not be mapped onto a whole group without distorting the matrix and the calculations derived from it. Graph theory cannot deal with what must be inferred or supposed from non-committal types of phenomena, and I compromised by recording these responses on the maps but not in the matrices;
2. a group member can write more than one text which receives directed lines, and so multiple points had to be accommodated arising from one participant. The alternative was to count the texts as separate entities completely, but this case study involves fifteen members of a tutor group, and I needed to maintain that boundary

and not present the group in abstracted ways which could distract from the core substance of the case, which is formed of fifteen teachers. This does not mean they cannot be separated from their texts for analysis, but it means that what counts as a point shifts. I accommodated this by naming texts 7a, 7b etc. to distinguish them but showed they were written by one of the fifteen members of the group.

As a way of dealing with these problems, the analysis has been made with reference to the real-world context in which the data is situated, and I have prioritised the realities of the social conditions of 'interaction' when interpreting the statistics. The analysis increased the importance of looking at the overall patterns of inter-relatedness in the group, and this shift away from an individual-focused perspective on texts has influenced the approach to the interview sample. Interview data from participants is used to establish further insights into how I should treat the content of their messages in terms of disclosure, and in terms of their perceptions of CMC as a social and literate practice. It became clear that the case should develop by talking to a representative range of teachers, not as authors of particular texts, but as participants in the overall practice, and I used the participation rates to help construct the sample.

In section 4.2.4 I calculated the average response rate per discussion of participants by using the outdegree totals of their adjacency columns in the matrices. By calculating the average number of responses over the three discussions, I was able to ensure that the sample of teachers I interviewed included a range of overall response rates in the discussions, based not on the number of messages they sent, but on the degree of reference to other messages:

Participant	1	2*	3*	4	5*	6*	7	8*	9*	10	11*	12	13	14*	15
Average response rate (outdegree)	1.3	1.3	4	1.3	4	0	1.6	2	1.3	2.6	1.3	3.3	1.6	3	3

* indicates participants selected for interview sample

Table 4.5 Participants selected for interview

This was a revision of my anticipated selection process for the interview sample, which had been to include teachers who stood out in the data because they wrote texts which were a 'null point' or a 'star' in the discussions. By using graph theory, it became clear that the overall patterns were more important for the case than individual texts, and that overall density and participation in neighbourhoods were important factors. I was more interested in the perspectives of the teachers as writers of texts in response to others, rather than as composers of a particular type of text which gains or fails to gain impact. This was a shift in my perception of what is important to understand about the 'impact' of CMC on TPL. The patterns over the three discussions showed that no one person consistently wrote 'null' texts or 'sociometric stars'. Instead I used these findings to construct the sample to include teachers with a range of response across the discussions in addition to other factors of gender, LEA/school sponsorship and school phase.

P6, who appeared to offer 0 responses to texts across the discussions is an effect of the anomaly of not being able to work with 'general' responses, as he did in fact send 1 general response in discussion 2. This still left him as the teacher with least connection to other texts in the group however, and for this reason I included him as the subject for the pilot interview. I was interested in what had happened and wanted to explore with him as soon as possible his accounts of writing online within the group.

The consequences for the interviews were that I wanted to talk to the teachers, but not about their individual messages. In the interviews I did not refer to anything in particular they wrote in the discussions and did not show them their texts. The interviews were held the following academic year, so they were at some emotional distance from writing the texts and from the immediate intellectual content within them. In fact, several of them commented that they did not remember much of what they actually wrote, but remembered vividly the experience of writing within the group. The interviews aimed to explore their perceptions of writing within a community and of online writing itself as a social practice which connects them with other individuals and with the group as a whole. The interview analysis then aimed to explore the role of such connections in TPL.

The mapping process established that the texts have different roles in knowledge construction processes. The initial task-generated texts act as catalysts for the discussion – they provoke responses, and act as the roots of the networks and the conceptual flow. They are produced individually, and each is isolated from other texts at the point of production. They are not connected through choices to the other texts. Texts therefore act differently within this particular CMC practice, according to whether they are task-generated texts or responses to them. For this reason, the task-generated texts shown in bold on the maps will not be included in the QCA analysis of the online discussions in chapter 5. The QCA pilot, as explained in Chapter 3 (3.5.7), indicated the problems of including the task-generated texts in the QCA model, because they were not ‘interactive’ at the stage of their production, which I now see as not ‘related’. Each one in fact, at the moment of writing, was a ‘null’ point and had no connection with another teacher’s text. Whereas all the texts written after that were written *in relation to* other’s texts. It became clear that the analysis of the textual content would be core to understanding the learning in the teachers’ CMC. QCA addresses the challenge of investigating conceptual content within a low density practice, with little interactive exchange of messages, because it focuses on exploring every message within a discussion at intra-textual level, and then seeks connections with other texts which are based on conceptual content, and are not constrained by iterative patterns of exchange.

4.5 Summary

The investigation into the impact of CMC on TPL was summarised at the end of Chapter 2 with four areas of investigation. ‘Inter-relatedness’ within the maps has contributed to considering evidence of these:

- i. joint thinking
- ii. meaning-making through textual exchange
- iii. community dimensions which indicate context-making processes
- iv. agentive and critical ways of thinking and the development of professional identities.

Joint thinking is not evidenced by highly interactive exchange in these discussions, and there are relatively few instances of chains of ideas being passed on between large numbers of individuals. The most important aspect of this preliminary investigation has been the shift to looking at the networking between texts as a practice among the community, rather than focusing on individual authors of online texts as a source of 'joint mental effort' (Mercer, 1995). It was a choice not to focus on investigating texts which represent 'sociometric stars' or 'null texts', nor their authors, because it is the overall connectedness within the group that emerges as important, rather than maximum inter-connectedness between members around special types of texts. This affects how the concept of community can be interpreted in this context. Members of networks may not need to be directly linked to points to be affected by the whole engagement with the practice which binds the group, and this is an important development in understanding the potential of CMC for TPL. TPL has often been regarded simplistically within managerial perspectives – as the transference of ideas or acquisition of knowledge from experts to less expert others. My shifting focus towards socio-centric networks as opposed to ego-centric ones has been a significant clarification for the community dimensions of the case. Mapping has produced results which support the argument that socio-centric networks can be identified among the teachers, and that these may have more significance for conceptual work than ego-centric networks. The process refocused the case so that the investigation into the texts is on the basis of them as a collective entity. They would need to be disaggregated from their authors for textual analysis. They would need to be analysed as online messages, for conceptual content to be identified. The texts would not be analysed as extensions of their authors, and the methodology would not focus on selecting individual messages as instances of more or less 'effective' texts, given the whole textual inter-relatedness of the practice they are part of. Thus joint thinking can be applied to this CMC context, but requires a considerable shift in considering socio-constructivist ideas of knowledge construction, because 'mental effort' is distributed among the group and not all members engage with what others have written through textual response. It adds substance to Koschmann's (2003) argument that learning in online discussion can be a 'sociogenic' practice, which involves a process of appropriating the social and technological resources produced by the context, and engaging

with both. Patterns of engagement are not regular or formulaic. In this case, the patterns of small neighbourhoods and limited paths suggest that conceptual contact may be very localised and intensely focused around responses to one or two texts, rather than spread over a series of interventions and knowledge-building processes between individuals. What was not known at this stage was the effects on meaning-making of the teachers of being exposed to all the texts – they only respond to a limited number, but the choice is made as a result of reading what *everybody thinks* in their initial task-generated posting. The relevance of reading all the texts is only discoverable through reading the responses and interviewing the teachers. The texts would be read to examine meaning-making processes which are discoverable only by detailed examination of the textual material in the context of the whole community.

Community dimensions have been seen in the context of ‘inter-relatedness’ between texts. TPL needs to be investigated as a process in which teachers are involved in a collective development of ideas through networking, but they do not necessarily have to be directly involved in working with every person or idea. Through textual connectedness they are part of a community which appears to steer itself and develop its own dynamic, and thus exerts agentive presence over the discussion and its content. Agency is directed away from individual-focused ways of exploring transformations within teachers as a result of engaging with CMC. Agency is instead a facet of online texts as culturally produced and as a vehicle for joint thinking.

It is the inter-connections between texts that emerges from the mapping as important in considering the impact of CMC on TPL. The patterns suggest that there are few moments of hiatus within the discussions which might constitute readily observable transformations taking place. Although there is evidence of excited activity in sociometric stars, this is still an experience which only a minority of the teachers shared. Instances of interactive hiatus are not reliable indicators of meaning-making. Such instances are not consistent, and focus on individuals who can produce a dramatic text. In considering ‘telling’ through writing, Tripp’s (1993) reminder is that, in teacher narration, it is the way an incident is reflected upon which makes it significant, not the dramatic quality of the incident itself. The more

relevant query which emerges is not “why does a ‘special’ text have this effect?” but, “what is it within the texts which is evidence of conceptual work, and how is it constructed as an effect of community, rather than an effect of particular individuals?” This is the critical question which now addresses the four themes identified as evidence of TPL within CMC, and which informs the qualitative analysis of textual content in Chapter 5.

CHAPTER 5 QUALITATIVE CONTENT ANALYSIS OF THE ONLINE DISCUSSIONS

5.1 INTRODUCTION

The aims of this chapter are to:

1. apply an adaptation of the QCA methodology to three online discussions conducted by the case tutor group to identify the features of TPL which are present;
2. analyse these features in terms of community and agentive perspectives on TPL; and
3. evaluate the QCA model to examine how electronic discussion can be researched, within the specificities of the case.

The adapted QCA model, which forms the basis of the textual analysis, was developed and piloted in Chapter 3 (3.5.3 – 3.5.12). It involved extensive reading and re-reading of the transcript data as part of an analytic framework, based on Garrison and Anderson's (2003) community of inquiry model for examining online discussion. Following the pilot, it incorporated six categories of conceptual and social presence, to address four themes which emerged from the literature on TPL and CMC: joint thinking; meaning-making; community dimensions and agentive and critical thinking. By coding according to the six categories, manifest variables of TPL were identified in the electronic text. When applied to the data, this model yielded examples of conceptual content related to TPL, called 'manifest variables', which were identified within the teachers' online texts. These manifest variables were then used to project a theory of the teachers' learning within the online group. From this theory, latent variables, which are normally 'submerged' and not explicit within the text, emerged through interpretation of the patterns, themes and connections within the manifest variables. The emergence of latent variables is the final stage of the qualitative process, and in this chapter they indicate the features of TPL through CMC which are derived from the teachers' texts. Finally, an evaluation of the method is offered to address the specificities of identifying learning within CMC in the case.

Section 5.2 presents contextual features involved in the production of the data, and 5.3 explains the method of data collection. 5.4 is a substantial section which presents and analyses the way the QCA model was applied to the data in three stages, to: identify manifest variables and code the text; analyse the manifest variables to develop a theory of TPL in CMC; and identify the latent variables. 5.5 is an evaluation of the methods which builds on reflection made throughout the chapter, and 5.6 is a summary of how the chapter meets the aims set out above with regard to the research question.

5.2 THE DATA

5.2.1 The context

This description of the data expands on the information about participating in the MTeach given to explain the mapping process in Chapter 3 (3.3). This is needed to contextualise the textual content of the discussions in this chapter. Online discussion in the MTeach is based on the facilitation of message-sharing and exchange through an electronic forum. The course did not use a purpose-designed educational conference support system, but instead participants discussed through a password-protected forum within YahooGroups, while the static MTeach webpages provided the course materials, readings and task templates, which participants downloaded to prepare for the online discussions.

The course is mixed-mode, in that the collaborative online activity was regular and compulsory, and was the main locus of participation in the first two core modules for the participants. They engaged in three online discussions over the duration of one module (one and a half terms) and met face to face three times. The module which is the context for the discussion was their first, 'Research and Professional Practice', and ran from October 2002 – February 2003. It required the participants to engage with educational research and consider its relevance to teachers. There are three compulsory online discussions which address these module aims, shown in the table below:

Module: Research and Professional Practice (RPP)	
RPP Online Discussion 1	What is the value of 'research in education'?
RPP Online Discussion 2	What is good educational research?
RPP Online Discussion 3	Teachers and research literacy

Table 5.1 The online discussion topics

The teachers enter into a discussion in which they are involved in an inquiry into a domain of professional knowledge. The fact that the teachers are discussing the relevance of educational research for their own professional practice clearly has an impact on the content of the discussions. The MTeach, as a context for the case, includes participants who have enrolled on a course aimed at furthering their professional learning. 'Course philosophy' (Lea, 2000) has been argued to have an impact on the ways in which participants engage in CMC in terms of how far a course promotes actively critical thinking (see Chapter 2, 2.3.3.2.1). Certainly, the fact that they are being asked to discuss a topic related to TPL can be expected to have effects on thinking within the examples of 'conceptual presence' which are due to the course aims and materials. It was therefore important to consider how far the evidence of conceptual presence is linked to social interaction within the CMC practice – that is to consider the 'way' of talking, as well as the 'talk' and if and how the two are connected

5.2.2. The tasks

Each discussion was based on a task which addressed an aspect of educational research. The tasks reflect a 'template-based' approach (Rüschoff and Ritter, 2001) to enable participants to capture experiences and write about them in the context of reading material. The task-templates encourage shared narration, and are based on the principle that teachers learn from practice through narrative approaches to reflection on experience, which are systematic and collaborative. An opening web-page explains the aims, purpose and context of the discussion within the module in which it is located. From this, participants can move

via hyperlinks either to the task itself or to a background paper written specifically by course tutors drawing on key literature in the field and listing background reading. The task usually offers a choice of questions, as well as links to two or three digitised core readings. Participants are encouraged to read the background paper and readings before they respond to the task (300-500 words) within a deadline. They then submit at least one further posting by a specified date, in response to the contributions made by their peers. The tutor then summarises participants' contributions and 'closes' the discussion. The initial task-generated postings and the responses aim to foster collaboration along the lines of the three educational processes – from divergence to convergence – outlined by Harasim (2000, p.54):

- idea generating (and gathering)
- idea linking, organization, and intellectual progress; and
- idea structuring (and convergence).

The sample of fifteen MTeach participants has been described in Chapter 3 (3.2.3).

5.3 DATA COLLECTION

5.3.1 The transcripts

The messages from each online discussion were downloaded from the forum to three word files and arranged in chronological order. Chronological order was chosen, since a message frequently made more than one response to various postings, so an attempt at any form of thematic threading was not practical and would not reflect the way the discussions were experienced by the teachers. The content of the message, the participants' names as pseudonyms, and the date and time of posting were also copied. The subject headers were not transferred, as many teachers did not include them and they are nearly all generic, e.g. 'Response to online discussion 1'. As described in Chapter 4 (3.5.11), the messages were divided into sections reflecting the 'responses' as units of analysis for mapping, which are nested within the messages. This 'nested' form was retained in the transcripts used for

QCA, as both units are entirely visible within this format, and the mapping process had made me familiar with the connections between the messages. The fact that I was already so familiar with the material was an advantage in the close reading of the transcripts, and maintained the overall awareness that QCA is one aspect of a case approach in which I do not exclude the previous ways I have examined the material, and acknowledges that I already have an understanding of the same texts as 'responses'. I copied each message exactly as it was written, with all spelling, typographical and grammatical errors maintained. It was important to capture the authenticity of the teachers' writing – what they actually wrote and what their peers actually read.

The volume of data made it necessary to impose bounds around the messages which were copied to form the transcripts. Only messages from the first module were used, as they contain a complete instance of the teachers dealing with a key area of professional learning, that is the relevance of educational research for teachers. By examining three discussions, the impact of CMC on TPL over the whole first module could be examined, allowing for any changes brought about by the teachers' growing familiarity with how to communicate within the forum, and establish confidence in participating (Salmon, 2000; Rovai, 2002).

5.3.2 Data sample

There were a total of 112 messages in the three discussions for the module (omitting two sent twice in error). By reading the messages repeatedly, four types of messages in the discussions were identified: participant initial task-generated messages; participant responses; tutor moderating/management messages; and participant management-related messages. The pilot established that the initial task-generated postings were self-contained, and the mapping in Chapter 4 established that they are not *written in relation* to other texts from teachers. They are therefore not included in the sample for QCA. The other messages which are not included in the data for QCA were part of the discussion but lack conceptual content, as they are management-related related postings from the teachers and from myself as the tutor. As a tutor, my messages aimed at 'moderating' the group (Salmon, 2000) are minimal and incorporate several purposes, to: establish clarity of how to participate;

encourage comfort and confidence in the participants and to acknowledge the relevance of the discussion by making a final summary. I excluded the 'tutor summaries' which I sent once the discussions had 'closed', since these are not evidence of the teachers' own articulation of thinking. The first discussion included ten messages I sent as tutor to establish management and social aspects of group, and these diminished once the group became familiar with the process. In the mixed mode context the participants met on three occasions during the module and had opportunities to discuss and clarify problems and issues about participating in the online discussion, and the need for tutor clarification and reassurance reduced as the module developed. Table 5.2 shows the distribution of messages sent categorised by the message purpose, and the final total of 41 messages selected for the sample:

Discussions	1	2	3	Total messages
Participant initial task-generated messages*	15	15	15	45
Participant responses	17	15	14	46
Tutor moderating/management messages	10	2	4	16
Participant management-related messages**	4	0	1	5
Total messages in each discussion*	46	32	34	112
Unit of analysis: total number of messages containing responses which are not only 'general' and not only a response to the tutor	15	13	13	Total sample (messages containing responses): 41

* messages sent twice in error have not been included.

** the vast majority of student management issues were dealt with by private email throughout the module, e.g. personal problems affecting postings, technical issues, registration and financial issues and do not form part of the discussions.

Table 5.2 Distribution of messages sent in the three online discussions and the sample in relation to this

5.4 APPYLING THE QCA MODEL

5.4.1 Overview

Applying the adapted QCA model took place in three stages. The first stage involved coding the data to identify the manifest variables of each category of TPL; the second stage involved analysing the manifest variables to develop analytical points, on which to base a theory of the teachers' learning, which I projected to explain the underlying meanings of the content; and the third stage involved identifying the latent variables which are derived from this theory in relation to TPL as affected by the practice of CMC. The methodological rationale for these stages has been explained in the pilot (Chapter 3, 3.5.6 – 3.5.10). In this section I report in detail on each stage of applying the model; include examples of the data; and reflect analytically on how each stage contributed to the development of the case perspective on the impact of CMC on TPL.

5.4.2 Stage one – coding for manifest variables

5.4.2.1 Identifying the categories

The first stage involved coding the data to establish the manifest variables which show that a category of social or conceptual presence exists in the messages. Each message was read as a whole, and then examined to identify what type of conceptual content it contained. The content was then coded according to the six categories I developed for identifying TPL in CMC (identity-building; meta-level engagement; teacher narration; scaffolding; argumentation and community-building). An account of the development of the adapted QCA model is given in Chapter 3 (3.5.12), including the summary of the categories and their indicators which were used and which are based on the literature examined in Chapter 2. The derivation of the categories and their indicators was also explained in Chapter 3 (3.5.14).

Coding was carried out by using word processing edit functions to mark the text, using a key to indicate the presence of a category. These functions were chosen because they allow for a message to be marked to show multiple categories co-existing within one selection of text. This is a development from the pilot, where coding was done manually by highlighting the text with pens. Coding a bigger volume of material is an intensive process,

and marking the text electronically allowed for revisions in coding to be clear and an electronic record to be maintained so that text could be transferred to the coding tables which showed its multiple features, as an aid to interpretation. It reflects the complexity and inter-dependence of different forms of conceptual content. The coding key is shown below, followed by an example of identifying the categories from the transcripts.

Categories	Coding
<u>Identity-building</u>	underline
Meta-level engagement	embolden
Teacher narration	highlight
Scaffolding	red font
Argumentation	comic sans ms font
<i>Community-building</i>	italicise

Table 5.3 Key for stage one coding

The coded transcripts contain a high volume of material which is stored electronically. To illustrate how the coding was conducted, an example is shown in Table 5.4 below, which shows the coding for categories of the first three messages from transcript 1.

MESSAGE 1 ANNIE Mon Oct 21, 2002 3:23 pm

(I know it's early but I'm off to Rome tomorrow!)

RESPONSE 1

I'm not going to try to answer all of Mary's questions, but I would like to suggest that perhaps you don't always need to find all the answers. Perhaps research is valuable simply if a practitioner has found it useful in one way or another. It sounds basic, but I imagine that some research is valuable to some individuals and other research is valuable to others. For example, the English teacher that you showed the research to, considered it "confirmation of his department's teaching philosophy" and was joyous when he read it must have seen the

value of this particular research immediately. Does there have to be more 'value' than this?

RESPONSE 2

I would have to agree with Linda, that research is "very valuable" to the practitioner if it makes you "feel better". If the research highlights examples that relate to one's own practice and experience, it is very reassuring in a profession where there is so little praise or recognition of the things we do well.

(By the way I have an even more stupid e-mail address!!!)

MESSAGE 2 MIKE Thu Oct 24, 2002 1:46 pm

RESPONSE 3

In response to the closing statement from Jenny:

"I was particularly interested, but unsurprised, to learn that one of the themes that Strauss found "...was how little questioning children actually do in school." During my teaching career I have always found that it has been difficult to effectively teach questioning skills and as a teacher I have received training about effective questioning".

I agree that pupils tend to question very little either. I personally believe that it is very difficult to teach questioning skills. I guess that one way to do this is to ensure that classroom activities continually expose pupils to situations where they are encouraged as a result to ask more questions or it could be in some cases that the pupils aren't finding what they are studying of interest or importance and so they 'switch off'. I am not sure of the answer except this is my view based upon past experience. I would be interested in other peoples' views on this.

MESSAGE 3 MIKE Thu Oct 24, 2002 2:00 pm

RESPONSE 4

Mary. I believe that after reading the articles that you were left pondering the overall value of Strauss's work. I too was of the same opinion, i.e that although the writer has supplied us with many of his own experiences and views, that it does lack statistical evidence and to this same extent it has left me questioning the overall validity of the research. Can research be based solely on the experience of one person's viewpoint?

Table 5.4 The coding for categories of the first three messages from transcript 1

5.4.2.2 Identifying the indicators of the categories

Once the categories within a discussion were identified, the coded items were examined to decide which indicator of that category was contained within the item. This involved interpretation and 'hermeneutical reasoning', to allocate the items as indicators of different types, and is where I had to revisit each item and 'fill with content' to interpret how it contributed to the conceptual content of the text. The allocation of content items to indicators within categories was based on intensive reading and judgements based on my theoretical derivation of the categories. This process established the elusiveness of clearly identifying the constituent aspects of learning in CMC. The warnings given about identifying learning within CMC (Garrison and Anderson, 2003; Laurillard, 2002 and Fayard and DeSanctis (2005) – see Chapter 2, 2.2.1) were given a different emphasis by the process. The elusiveness of identifying learning was based on addressing the challenge of identifying the 'meaning' of the text from my own interpretation. It made concrete the challenge of 'hermeneutical reasoning' in which there is a danger, according to Eagleton, of seeking to find an harmonious whole where it does not exist:

Striving to construct a coherent sense from the text, the reader will select and organise its elements into consistent wholes, excluding some and foregrounding others, 'concretising' certain items in certain ways; he or she will try to hold certain perspectives within the work together, or shift from perspective to perspective to in order to build up an integrated 'illusion' (Eagleton, 1983, p. 77).

The ‘illusion’ is both a warning and an invitation in building the case. Eagleton is attempting to show that all acts of interpretation involve creating something which only exists in the stance of the reader. His point is that all interpretation is political, and there is a tendency towards stability and integration in the interpretation of texts, which is often unacknowledged. In applying ‘reasoning’ to the text, I was mindful of the need to be explicit about how I was making decisions. Interpretation *necessitates* imposing a ‘whole’ which can be communicated, and this is not what Eagleton criticises. The potential problem is of not addressing it as a constructed ‘illusion’. In this sense, the textual interpretive practice is akin to Koschmann’s (2003) perspective on *inquiry itself* as the proper focus of interpreting online discussion. In interpreting the text, I have attempted to make the process as transparent as possible, but ultimately, in one sense, my account is a representation of how an ‘illusion’ was constructed. This, rather than invalidating the data, is part of the way it is further ‘recontextualised’ (Brown and Dowling, 1998, p. 8), by which they mean the “objectification of your activities is always a different experience from your experience of those activities themselves”. My part in the research constitutes the meaning of what the teachers wrote, and forms part of the complex of their professional learning which constitutes the case. In this chapter I have attempted to be as explicit as possible about the hermeneutical reasoning I have applied, in both shaping the textual material to become data, and in interpreting it.

The tables of coded items have a high volume, and so I have shown examples of them in two forms. Firstly, Table 5.5 contains an example of manifest variables from each category. Secondly, the complete coding table for the category ‘meta-level engagement’ is included as Appendix V.

Table 5.5 shows examples of the manifest variables for each of the categories which are drawn from the sample. This illustrates how the content items range from one to several sentences or several paragraphs, but each item contains a complete variable which is an example of an indicator of one of the categories:

Category	Indicators	Examples of manifest variables
Identity-building	Autobiographical insights	Back in my days of being newly qualified with the emphasis firmly placed on the newly introduced "National Curriculum" I do not think that I would have had the belief in myself to [evaluate and adapt changes].
	Stating values	In her final paragraph, Jane says that if we are research literate we can make decisions for ourselves, rather than letting others do this for us. On first reading, I thought that if the pendulum were to swing too far, we may move back to the days pre-National Curriculum. How do we feel about that??
	Raising ethical issues	I believe many teachers have become despondent and negative towards change because it can be a genuine human fear, also and probably more importantly it is 'being done to them' rather than them being involved in the process.
	Identifying purpose	We must use the children's interests as starting points to really engage them in their own learning.
Meta-level engagement	Discussing own and others' learning	Angelique's final comment about our discussions being a 'journey' highlights the luxury of being able to consider and reflect on not only our own views but those of the whole group. This course is providing us with the opportunity, (and probably forcing us to make time), to do this and I agree it is proving a very positive experience.
	Reconsidering views	Mary makes an important point that the intended target audience of practitioner research is so crucial. Perhaps if I had thought about this I might have been a little less irritated by Sullivan's language. It is quite probable that the pieces of research, that we were asked to comment upon, were not designed to be read by practitioners.

	Creating 'what if'/hypothetical scenarios	I really like reading about feelings provoked by teaching (usually frustration!) but in a more general sense and not to necessarily be an input to my lessons. But who knows? If I find some research by an ICT teacher's emotional turmoil in the secondary classroom, I might just put the ideas into practice! Or perhaps, I should write it?!!!
Teacher narration	Critical incidents	<p>I found it interesting recently when I was on a course for 'Teaching children with difficult and challenging behaviours', and I started 'people watching' mainly at times when the speaker mentioned new initiatives, ideas, even suggestions. I noticed that many looked either dismissive, or made it very obvious that they were sceptical about these ideas. In their eyes, they already had judged whatever the new ideas were, and decided that they weren't going to work in their classes, even without challenging them.</p> <p>The Headteacher from my school was also on this course, and I let her in on what I was doing, and why I was doing it. Rather than thinking that I was peculiar she was really interested, and believes strongly that teachers should be research literate. She also went on to say that she tries to read the latest research, but for her it is the time factor which is the main issue.</p> <p>So, where do we go from here? Most teachers can see the benefits in being research literate, but unless teachers are given the time, taught how to access and decode the research, etc, teachers are going to always 'get by' without realising that there are other ideas out there, which could work in their classrooms.</p>

	Situated accounts/ episodes	Neil mentioned the cold hall scenario which I totally agree with Neil. In some schools I think that in some schools that Inset days are viewed as something that have to be done (almost swept under the carpet) without any due regard to the quality of the inset.
	Reflecting on teaching	I have always found that it has been difficult to effectively teach questioning skills.
Scaffolding	Asking a question	Can research be based solely on the experience of one person's viewpoint?
	Answering a question	I'm not going to try to answer all of Mary's questions, but I would like to suggest that perhaps you don't always need to find all the answers.
	Echoing/ Repetition	I know that I do still spend a lot of time feeling how Mike described; "getting through rather than doing the job well" Is this because there really is too much to get done in a limited space of time?
	Modifying/ augmenting ideas	Mary's concluding comment about 'how useful research would be!' made me consider the importance of contemplating and discussing the 'why's' of new initiatives rather than, as is usually the case, the 'how's'. We are always told 'how' to implement policies but rarely 'why'. Without this 'why' knowledge it is difficult to be flexible and develop our practice effectively.
Argumentation	Proposing a new idea	I wonder if ITT providers might extend the current QTTs and build in a continuing research element for the NQT year? It could be assessed as part of the validation of the training year. That would start a process of expectation that all teachers 'extend their repertoire' by becoming research literate. Although this doesn't address the issue of time and/or desire to investigate educational research for qualified teachers, it IS a beginning!

	Agreeing	Dave identifies teachers as sceptical (with which I strongly agree!)
	Disagreeing	I'm going to have to disagree, I'm afraid! I definitely NEED answers to questions and certainly, some context when considering research and, to be honest, I think we ALL do...we all like putting 'items in boxes'. Human nature.
	Illustrating	For instance, the minute you speak to the teacher who previously taught your problem/genius child, or speak to his/her parents or read a report, you are contextualising the knowledge you already have of the student and your perceptions change. You can't help it.
	Using rhetorical devices	(I can compare this experience to my weekly struggle to attend the gym - once finished I feel remarkably better!)
Community -building	Empathising	Tarsim's response to the online discussion was also of interest to me; I could relate to her views on the teaching of non-fiction writing (specifically boys).
	Seeking peers' views	I have minor issues with the term 'fuzzy generalisation' but can't pinpoint why! Does anyone else feel like that?
	Expressing mutuality	Is this not why, as a group of experienced teachers we are undertaking further study in the first place...to be of value to us!
	Social bonding	I had written 'Dave' a few times in my response, but then I saw that you may also be 'Angelique'. I don't mind who (or what gender!) you are, but I decided to take out the names!

Table 5.5 Examples of indicators and manifest variables for each of the TPL categories

5.4.2.2.1 Reflection on constructing the coding tables

Most items feature in more than one category, or as more than one indicator of a category. For example, an item written in response to P12 disputes her view: “I actually quite like the fact that [the author] highlights the ‘ills of teaching’ as I feel akin to him – as if he is truly ‘one of us’ and thus really understands what we experience in a day”. This is an example of both ‘disagreement’ with a previous opinion (for the category ‘Argumentation’) and of ‘empathising’ (for the category ‘Community-building'). Coding tables were made for each category, to record all the examples of each indicator. Both the tables and the transcripts were read three times to identify any erroneous or erratic coding and adjustments made. As a result, a theoretical perspective was already informing the patterns which were forming according to my ‘filling with content’ the words in the messages, and my inquiry constituted these patterns.

The tables reflect that in the category ‘scaffolding’ no variables were found for the indicator ‘seeking clarification’. At the same time, there were 26 variables of the indicator ‘modifying/augmenting ideas’ which involves elements of clarification, but shows that participants contributed in this way without actively seeking clarification. Many of the items in ‘asking a question’ were also seeking clarification. This suggests that this was not a valid indicator, as seeking clarification as an aspect of scaffolding was already sufficiently catered for.

The tables reflect that in the category ‘community-building’ no examples were found that were ‘sharing a repertoire’ or ‘engaging purposefully’. Reading the whole transcripts and reading the tables of indicators for community-building did suggest, however, that both of these are aspects of the discussion, but they are identifiable by interpretation, not by declarations made by the teachers. At this stage of the coding, I made a note to examine these areas for developing the theoretical interpretation of TPL in the discussions. I was aware of the warning given by Garrison and Anderson that ‘latent’ variables are more difficult to discern in online texts, and that I should beware of deriving complex variables at the first declarative stage from the theoretical analysis of the content of interest. They should be allowed to emerge from the manifest variables. I had expected the teachers to name these things, as I had erroneously expected them to engage with complex concepts in

the interviews, rather than my interpreting them theoretically. This was noted for the next stage of applying the model. Learning to work systematically with stages of interpretation is an aspect of the case development.

Appendix V is an example of a coding table, which contains the coding for transcript 3, for the category ‘meta-level engagement’. The left hand margin was used for handwritten notes in analysis of the manifest variables. Once the tables were complete, I numbered each item for ease of identification during the second stage of analysis. Each item was given a reference number comprised of four parts: the transcript in which it appears (from online discussion 1, 2 or 3); the category where it is allocated, denoted by the first letter (I, M, T, S, A or C); the indicator of which it is an example (letters a – z); and the number where it appears in the table of indicators for that category. The reference number will be referred to in explaining the derivation of the manifest variables during the analysis, but it is necessary to also provide the content of the textual material being analysed, as the interpretive process needs to be explicit and is rooted in my own meaning-making and interpretation of the participants’, which requires close attention to the concepts themselves as they appear in the text. The reference numbers are not then used in the subsequent stages of analysis which involve developing a theory of TPL, as the density of multiple textual references would obscure a coherent reading of the analysis and it is important to read the content to understand the analysis, rather than cross-reference with the tables which would be an obtrusive process. QCA as a ‘cross-over technique’ requires sustained engagement with the meanings found in the texts themselves, as well as detailed itemisation of items within the text. Extensive referencing was found to be disruptive to sustained engagement with the qualitative analysis and the reading of it.

From the six coding tables, the total number of manifest variables for each category could be identified across the three transcripts. There were 296 variables in total. The process of collating the variables was a further opportunity to check for errors and confirm the coding across the three transcripts. Table 5.6 below shows the distribution of manifest variables for each category.

Categories	Indicators	1	2	3	Totals
I - Identity-building	Autobiographical insights (a)	8	6	4	18
	Stating values (b)	6	1	4	11
	Raising ethical issues (c)	0	2	0	2
	Identifying purpose (d)	6	3	3	12
	<i>Total indicators for 'I'</i>	20	12	11	43
M - Meta-level engagement	Discussing own and others' learning (e)	8	9	6	23
	Reconsidering views (f)	2	3	3	8
	Creating 'what if'/hypothetical scenarios (g)	1	0	3	4
	<i>Total indicators for 'M'</i>	11	12	12	35
T - Teacher narration	Critical incidents (h)	3	1	2	6
	Situated accounts/episodes (i)	4	5	3	12
	Reflecting on teaching (j)	5	0	0	5
	<i>Total indicators for 'T'</i>	12	6	5	23
S - Scaffolding	Asking a question (k)	4	6	7	17
	Answering a question (l)	1	0	0	1
	Echoing/repetition (m)	4	3	5	12
	Seeking clarification (n)	0	0	0	0
	Modifying/augmenting ideas (o)	9	9	8	26
	<i>Total indicators for 'S'</i>	18	18	20	56
A - Argumentation	Proposing a new idea (p)	4	2	4	10
	Agreeing (q)	10	14	12	36
	Disagreeing (r)	6	4	3	13
	Illustrating (s)	3	1	1	5
	Using rhetorical devices (t)	6	5	4	15
	<i>Total indicators for 'A'</i>	29	26	24	79
C - Community-building	Empathising (u)	3	3	3	9
	Seeking peers' views (v)	1	1	0	2

	Sharing a repertoire (w)	0	0	0	0
	Engaging purposefully (x)	0	0	0	0
	Expressing mutuality (y)	18	7	14	39
	Social bonding (z)	5	2	1	8
	<i>Total indicators for 'C'</i>	27	13	18	58

Table 5.6 Distribution of manifest variables for each category

5.4.2.3 Examples of stage one coding

To illustrate the coding in practice, I include four examples of analysis of a manifest variable of a category, all of which were included in Table 5.5. The variable is presented having been coded, as it appears in the coding tables. For each one, the interpretation of the manifest variable is presented in detail, to explain why it is assigned to an indicator of a category. The detail is necessary to make a representation of the act of textual interpretation, which is an internal, subjective and complex process and the presentation of it needs to be situated closely in the data to communicate the process of inquiry which was involved. An example of how a variable is referenced according to the coding is given below.

For a manifest variable identified as 3Mg#2:

3: the item is from the transcript of online discussion 3

M: it belongs to the category 'Meta-level engagement'

g: it is an example of the indicator 'Creating what if/hypothetical scenarios' for this category

#2: it is number 2 of the examples entered in the coding table.

(See Appendix V for a detailed illustration of how the messages appear as coded items in the coding tables.)

Many items used as examples in Table 5.5 appear as manifest variables in the coding tables for more than one category. Where this happens, all the references to where it appears as a coded content item are given, as below.

Example 1

3Ib#2, 3So#2 and 3Sh#7

In her final paragraph, Jane says that if we are research literate we can make decisions for ourselves, rather than letting others do this for us. On first reading, I thought that if the pendulum were to swing too far, we may move back to the days pre-National Curriculum. How do we feel about that??

This appears as a manifest variable for 'stating values' related to the category 'identity-building'. It appears three times in total in the completed coding tables, as it is also a variable of 'augmenting ideas' and of 'asking a question' in 'scaffolding'. The interpretation of the content is centred on the inter-relationship between the indicators. Values are raised because the teacher refers to issues of teacher autonomy suggested by another participant (Jane), about whether teachers should be allowed to 'make decisions for ourselves'. Autonomy is a feature of agentive professional identities, and in this posting the teacher expresses uncertainty about the appropriateness of this, and concerns about the removal of centralist control over teachers' decisions, via the National Curriculum. Her concerns are a feature of 'augmenting' because she implies a qualification of the original concept that Jane proposed, that 'if we are research literate we can make decisions for ourselves, rather than letting others do this for us'. She implies a risk in the original assertion by suggesting the notion of a 'pendulum swing' that could 'go too far', implying an excess or lack of reasonable restraint. The augmentation of the concept is completed by asking a question which can be interpreted as either a genuine invitation to others to help decide whether this would be a good thing, or as a rhetorical subtext in which the implication is that collectively, the teachers as 'we' should resist such a suggestion. Thus the conceptual content is complex, and relies on the indicators being interpreted inter-dependently.

Example 2

3Me#5

Angelique's final comment about our discussions being a 'journey' highlights the luxury of being able to consider and reflect on not only our own views but those of the whole group. This course is providing us with the opportunity, (and probably forcing us to make time), to do this and I agree it is proving a very positive experience.

This manifest variable appears as an example of the indicator 'discussing own and others' learning' in the category 'meta-level engagement'. It also forms part of a text which is a variable of 'empathising' in the category 'community-building' but is dependent on the rest of that text to illustrate why it shows 'empathising', so is not treated as a variable in that category in its own right. It also appears within a longer section of text as a variable of 'echoing/repetition' within the category 'scaffolding', but the complete evidence of it as an example of 'echoing' is extended in the original paragraph, which is included in that coding table. Therefore, this is the only instance of this version of the item appearing as a complete variable. It is an indicator of 'discussing own and others' learning' because it addresses the way the group is on a 'course' which has effects on their learning. It restates the claim made by another participant, Angelique, that this is a metaphorical 'journey' and explains the metaphor, 'this course is providing us with the opportunity...to do this'. Then a qualitative judgment is made about the learning experience 'it is proving a very positive experience'.

Example 3

3Ti#3, 3Aq#11 and 3At#4.

Neil mentioned the cold hall scenario which I totally agree with Neil. In some schools I think that in some schools that Inset days are viewed as

something that have to be done (almost swept under the carpet)
without any due regard to the quality of the inset.

This manifest variable is an example in Table 5.5 of the indicator 'situated accounts/episodes' for the category 'teacher narration'. It also appears as a variable of 'agreeing' and of 'using rhetorical devices' in the coding table for the category 'argumentation'. It indicates that the ideas which the author expresses are situated in a particular practice-based context, the 'cold hall', which is recognised from the original message from Neil. He refers to this as a 'scenario' so that the context is shared with peers as a place and situation they would recognise from experience. The use of this as a 'scenario' is a foundation on which to build an associated concept of In-service Training days as lacking 'quality', and expresses it through a metaphor as something to be quickly disposed of ('almost swept under the carpet'). The metaphor as a rhetorical device adds emphasis to the concept. The cold hall which was introduced in a previous message acts as a signifier of something other than itself, i.e. an unfulfilling training experience. In agreeing with this as what was originally signified, the author expands and augments the concept into a generalised comment on 'some schools' and offers a conjecture that unsatisfactory training is experienced particularly as something dispensable.

Example 4

1Ar#1 and 1Me#8

I'm going to have to disagree, I'm afraid! I definitely NEED answers to questions and certainly, some context when considering research and, to be honest, I think we ALL do...we all like putting 'items in boxes'. Human nature.

This is a manifest variable of the indicator 'disagreeing' in the category 'argumentation'. The indicator 1Ar#1 is a clear disputation of a previous reply which suggested that answers to questions are not always necessary. To give weight to the disagreement as an argument

about a principle, there is an appeal to the general consensus that this must be the right opinion. The author invokes her peers ‘I think we ALL do...’ in an assumption that there will be agreement with her interpretation of the need for answers. She adds emphasis to her disagreement by capitalising ‘ALL’, to suggest that this is the consensus. The point is finally made that this is a ‘common sense’ deduction based on ‘human nature’, and therefore indisputable. 1Ar#1 includes within it another variable, 1Me#8, which is an indicator of ‘discussing own and each other’s learning’ in the category ‘meta-level engagement’, which is the conceptual basis on which the disagreement is made – that humans ‘like putting “items in boxes”’.

5.4.2.4 Reflection on coding for manifest variables

The coding revealed the difficulty of separating variables in this CMC context. The key was important to reveal just how complexly interwoven the conceptual work is. Much of the text includes variables of both social and conceptual presence, and while they demonstrate the presence of the elements of learning, they do not occupy discrete parts of the text. This is not something discussed by Garrison and Anderson in their account of coding using the model, although it confirms the link between the methodology and its theoretical underpinning – their assertion that the educational transaction is a “unified process” which “recognises the interplay between individual meaning and socially redeeming knowledge” (2003, p. 12). In this particular context, cognitive and social presence are co-existent within the text. This is consistent with theoretical perspectives of texts as cultural products, by which written language is encoded with meaning within shared social contexts – the socio-cultural dimensions of meaning-making, emphasised by Mercer (1995), emphasise that *all* language not only affects, but constitutes the social and individual meanings of things. Thus, Stage One of coding for manifest variables has identified the features of TPL which are present on the surface of the text and thus started to address the first aim of the chapter:

to apply an adaptation of the QCA methodology to three online discussions conducted by the case tutor group to identify the features of TPL which are present.

At the same time, the features of TPL which are identified are not presented as consistent or objective ‘truths’ about TPL in CMC. The breaking down of conceptual work into constituent cognitive and social elements is essentially a process of inquiry by which the phenomenon is more fully understood but cannot be fully known. The *act* of inquiry itself involves learning about the phenomenon, rather than producing knowledge about it. Its meanings are embedded in my engagement with the inquiry process. The derived codings themselves are debatable, and a different coder may assign conceptual material differently and arrive at different conclusions. The research context does not allow for inter-coder reliability, but this is not a valid way to interrogate the data within a case approach in which the researcher has the role of making sense of the data, aided and constituted by the narrative I construct, rather than an attempt at objective correlation of findings. The findings are judged within the case itself, as this is what provides ‘reality’ as a context for interpreting what happens. Chapter 3 established the rationale for the appropriateness of a case approach for the research, and in interpreting the textual data I am mindful of Frey’s (2004) criteria for conducting a case study in relation to a view of ‘reality’. The assertion is that realities are multiple and constructed, and the researcher is inseparable from what is known. Together with developing the case as what Flyvbjerg calls “a nuanced view of reality” (2006, p. 223), this argues for a stance towards the relationship between what is discovered and what is ‘real’ as being dependent on the researcher’s narrative, through which the constituent parts of the whole of the case are focused and form a coherent explanation of the phenomenon in question. The QCA model has been adopted in line with this stance towards case development, because it establishes inquiry as the *process of discovery of meanings*, not as the discovery of knowledge as fixed or certain. Therefore in ‘qualitative content analysis’ the *analysis as process* is the core of the research, involving a learning experience for the researcher which is part of the research itself. Therefore, the ‘findings’ in relation to TPL must be seen within this perspective.

5.4.3 Stage two – interpreting the manifest variables

Once the manifest variables were identified, an analysis was made of the prevalent features of the teachers' writing across the examples. The aim was to scrutinise the variables within each category, and interpret their main features and recurrent themes, to clarify what appears on what Garrison and Anderson refer to as the 'surface' of the text. Then, these were used to interpret what is happening beneath the surface of the text, and which does not appear at a declarative level. The manifest variables identified for each indicator from each transcript are examined as a whole. This is an inductive process. The manifest variables for each indicator were read, and notes made on the tables as linking themes emerged. They were then re-read and further notes were made to show the persistent patterns and themes which emerge from the data itself. These notes formed the basis for an interpretation of the manifest variables of each indicator. These were then read together and key points were identified which contributed to the formation of a theory of TPL within CMC. Thus the second stage involved intensive reading and re-reading of the manifest variables to develop a theory which I could 'project' about the conceptual content of the online writing, and which contributes to addressing the research question, 'what is the impact of CMC on TPL?', which involves moving on from the first aim of the chapter to the second, which builds on having identified the surface features of TPL within CMC:

to analyse these features in terms of community and agentive perspectives on TPL.

In the sections which follow, I have made an interpretation of the prevalent features of the manifest variables found for each indicator within the six categories. Examples selected from the manifest variables are quoted, but not every example is referred to, because of the considerable volume of material, and the need for a coherent, interpretive narrative to 'concretise' "certain items in certain ways" (Eagleton, 1983, p. 77).

For each category, I have extracted a set of analytical points which synthesise and refine the interpretation of the manifest variables. The points are derived by reading across the interpretations for each indicator, given in separate paragraphs below. This is to form a coherent overall analysis of the features of TPL in each category. The set of analytical

points is developed to identify the contribution made by the manifest variables in that category to a theory of TPL, which is situated within the practice of CMC in this tutor group. The points, which are arrived at inductively, are collected in a later stage and used as a basis for projecting a theory of TPL which takes account of the community and agentive perspectives which emerge.

5.4.3.1 Analysis of category: identity-building

Autobiographical insights

Autobiographical insights into the teachers' practice over time are present where their messages are informed by references to statutory policies and practices which have affected them as teachers: 'I have received training about effective questioning'; 'being newly qualified with the emphasis placed firmly on the National Curriculum'; 'not being required to teach the Literacy Strategy'; 'in a weekly plan, work set around fiction can lend itself to phonics, rhyming words, adjectives, adverbs, etc.'; 'KS2, KS3, KS5 and numeracy and literacy initiatives'; 'INSET and various courses...like new examination courses'; 'SATS and QCA results'; 'an SEN environment'; 'INSET days'; 'one INSET session'; and 'the NQT year'. These are declarations which indicate the statutory contexts which provide the frameworks within which practice takes place, and can be made the subject of comment and reflection. Specialist language and acronyms are not explained, and none are queried, thus a specialist language operates as a bond within the group, in which they are included and knowledgeable. Their reflections on practice within these frameworks shift between Transcript 1(T1) and Transcript 3(T3).

In T1, there is an articulation of uncertainty and self-doubt regarding professional capacities for thinking and action: 'I have always found that it has been difficult to effectively teach questioning skills'; 'I am not sure of the answer'; 'I do not think that I would have had the belief in myself'. At the same time, experience is valued as a source of increased knowledge and authority to have opinions and develop practice: 'My personal opinion, stemming from my personal experience, is...'; 'Over the years, I've found that...';

‘This is my view based upon past experience’; ‘During my career, I have always found...’. ‘Experience’ in itself is viewed as a foundation for developing opinions and for sustaining effective practice, ‘as real practitioners we don’t have the time to consult research from several different sources and evaluate it’. There is an appeal to a common sense of professional identity as being rooted in practice itself and the rejection of less authentic practice involving intellectual research dimensions. A conflict is introduced by this indicator between the concept of being a ‘real practitioner’ and being a person who could ‘consult research’.

Manifest variables in T2 introduce a criticism to the experience of training provision, with the qualifiers ‘but’ and ‘only’: ‘various courses are available but mine over recent years have all been very practical things...and we are only allowed to attend one a year’. They declare a lack of opportunities to learn with others: ‘it concerns me that there are few opportunities within schools to share...expertise’. The concept of teachers’ development becomes less straightforwardly a matter of relying on experience. Personal autobiography is used in one variable to express an insight into the way the discussion has become less clear cut; ‘I find myself...transported back to my days of A-level English when we spend hours contemplating whether Hamlet was really mad’. Three variables contribute unsettling elements to the discussion, which disturbs the general consensus about ‘personal experience’ being sufficient as a foundation for developing practice. The first of these is the confirmation that there are ‘lazy’ teachers who ‘just want to get through’. The second is a reference to the lack of time, which disputes the idea that teachers will capitalise on experience, because they do not have time to pool experience and share expertise ‘However genuine the desire...there is rarely the opportunity to do so’. The third raises a question based on their everyday experiences, ‘As Linda considered, should our environment become more philosophical?’ This is a call for a shift in the ways the school ‘environment’ could change to encourage more discussion about practice and less emphasis on ‘more mundane, less interesting (and definitely of less importance to the education of the students) aspects of the ‘job’’. Criticism of the frameworks and agendas which shape teachers’ learning becomes explicit. One variable is an autobiographical insight offered ‘As

the Literacy Subject Leader' from one participant, who states 'the government analysis [of SATs and QCA results] does tend to make sweeping statements.'

A manifest variable in T3 makes an assertion about professional identity: 'as teachers undertaking further studies, we realise the importance of research within education'. It also makes the point that a focus on individuals is insufficient to bring about a change in wider professional identity: 'but we are such a small minority'. Value judgements are brought to bear on autobiographical insights: 'no more pointless INSETs [In-service training days]' and 'this is probably the only INSET session I can recall quickly and the only one I have really reflected upon'. This increase in critical tone is maintained in the variables in T2 and T3, and suggests a conflict between statutory/managerial related frameworks and meaningful professional development is being conceptualised by the teachers as a result of drawing on their experiences.

Stating values

The manifest variables for 'stating values' relate to the nature of professional thought and action. In T3 there is a strong assertion of values and belief systems. An assertive statement is made regarding collective professional identity: 'I believe by the nature of our job we have the ability to think critically about a huge range of 'research-based' initiatives presented to us. Through our own practice we are able to identify weaknesses and make judgements'. The link between practice and learning to think critically is made by referring to 'the nature of our job' and knowing 'through our own practice'. The concept of 'thinking critically' however also poses a threat: 'Jane says that...we can make decisions for ourselves, rather than let others do it for us...if the pendulum were to swing too far, we may move back to the days pre-National Curriculum. How do we feel about that?' Others though state 'I wonder if it a question of becoming more outspoken, in other words, less accepting of what we are told. As professionals we should be able to question change and not be content with having it 'inflicted' upon us (Angelique's term)'. Thus these variables also

indicate the presence of struggle around values and the consequences of thinking differently.

Raising ethical issues

Only two manifest variables for this are present. The variables describe how some teachers become ‘despondent’ and ‘negative’ because change involves ‘a genuine human fear’ and resistance to change ‘being done to them’. This variable suggests that teachers can be viewed as victims of change. The other variable links with this in referring to teachers as ‘troopers’, again with an emphasis on coping with adversity as a part of what the job entails. A concept of considerable conflict within professional life underpins the issues raised by these indicators, although this is an area with limited declarative statements.

Identifying purpose

These manifest variables suggest that ‘purpose’ is values driven, e.g. ‘We must use the children’s interests as starting points to really engage them in their own learning’. This is an assertive pedagogical perspective, used to unite the group in the collective pronoun ‘we’, and imperative ‘must’ which assumes a shared and non-negotiable view of a key driver of professional practice. ‘Purpose’ is linked to ‘improvement’ in most of the indicators, in the sense of developing practice to improve pupils’ learning: ‘my...approach has a direct effect on both my teaching and learning’; ‘Personally, in order to improve teaching and learning...’; ‘if we evaluate our teaching then at least we would be focusing the energy we have into offering solutions and heading in the best possible direction’. This variable contains evidence of unease with taking a political stance on issues affecting teachers’ development: ‘without wanting to be too political, in the last two years at secondary level, we have changed...how can schools possibly do all of this properly?’ T2 and T3 however, include manifest variables which express purpose as an explicitly political issue: ‘how teachers view their role within the *education* system...could have a positive effect on *teaching and learning* within the classroom and education system as a whole [participant’s

italics]'; 'this reflection focuses on things that can only be dealt with at a macrolevel i.e. necessitating a change in culture' and 'maybe it's the attitude...that needs to change'. These indicators stand in opposition to others which have suggested that individual differences between teachers regarding a political orientation are fine, and that this is a matter of personal choice. A comment is made regarding the problem of 'one teacher' trying to initiate change, and the point is made that it needs to be collective or systemic – at 'macrolevel'.

The contribution of 'identity-building' to a theory of teachers' learning can be summarised by the following points:

1. The use of specialist language establishes membership of this group.
2. 'First order' (Laurillard, 2002) ways of knowing (i.e. based on immediate experience) are readily accessible to the teachers, but
3. Experience becomes problematised as a foundation for professional learning.
4. Counter-narratives disrupt 'grand narratives' around INSET days, Standard Tests for pupils and government initiatives as unquestionable sources of improvement.
5. The concept of collaborative professional identity starts to disrupt beliefs that personal choice and individual difference are sufficient as a foundation for practice.
6. Explicit political discourse is a disconcerting concept for the teachers, despite the oppositional stance which develops towards contemporary systemic constraints on teachers' practice.
7. Practice moves from prescriptive certainty to negotiated uncertainty.
8. The struggle of coming to terms with an uncertain practice is considerable. Taking responsibility for professional thought and action is not something that all the teachers find a desirable aspect of their identity.
9. Oppression is conveyed in the term 'inflicted' which has been repeated from another message. It suggests that teacher identities are constituted in oppression and conflict (external factors) as well as personal differences (internal factors).
10. Teacher identity is constituted in difference but is linked to core values aimed at improving pupils' learning.

11. These teachers articulate practice as involving the exercise of critical thinking and developing judgements as intrinsic to ‘the nature of the job’.

5.4.3.2 Analysis of category: meta-level engagement

Discussing own and others' learning

Individual experience appears as a source of professional learning, but is qualified by an appeal to peers to offer a wider perspective on the development of ideas: ‘I am not sure of the answer except this is my view based on past experience. I would be interested in other people’s views on this’. Variables make specific references to peers who have made an impact on the thinking of the authors: ‘Linda’s first comment made me sit up and think’; ‘Annie states that...and I think Annie is right’ and ‘Mary’s concluding comment...made me consider the importance of...’ These variables are based on participants accepting the provisionality of thinking within the discussions, and several variables comment on the process of reading the postings as part of the learning experience: ‘Reading through the tutor group’s postings it shows...’; ‘I have just spent an hour reading through the postings and trying to think of an angle from which to write my reply’; ‘Having read all the discussions and responses so far’ and ‘Having read all of the task responses’. They let the group know that as individuals, they are actively engaging with the postings. Several of the variables show the teachers are trying to work with the prevalent ideas within the group, and work out their own stance in relation to these, ‘...the biggest ongoing line of thought running through was the issue of time, so I decided to think about how this problem could be addressed’ and ‘this all brought me back to the original piece of research I studied...in the end I actually felt like I had missed an obvious point’. The emphasis on reading the other messages leads to several assertions of diversity in the interpretations they contain; ‘Whilst some held this view...others found it less useful’; ‘There are obvious conflicting opinions within our own tutor group’ and ‘People’s views were very varied’. Meta-level variables included both reflections on individual and collective engagement and learning, ranging from the individual: ‘I am also aware that my logical ‘items in boxes’ approach has a direct effect, not only upon my self-evaluation, but also on both my teaching and

learning' and 'I actually felt like I had missed an obvious point', to comments which are based on the collective learning experience: 'this course is providing us with the opportunity to [reflect not only on our own views but those of the whole group] and I agree it is providing a very positive experience'. The metaphor of 'our discussions being a journey' is used in one variable to express the learning experience. Variables refer to the nature of being on the course and speculate on their engagement with it, asking specific questions to each other: 'I think the two pieces were picked by the institute to offer 2 very different pieces for us...'; 'Will it be OK to adapt the checklist slightly to meet the demands of the research pieces that we will be expected to do as part of this course?' and '...it will be interesting to see how we are judged if we choose such a reflective approach!'

Reconsidering views

The manifest variables of 'reconsidering views' all relate to reconsiderations involving others. They are explicit in stating that another text has made the author revisit an idea and think again about it, resulting in a different interpretation of the idea, and they refer to acts of knowledge construction involving others: 'I have brought two interesting parts of [Angelique's] critique together because it posed a new question to me, which I hadn't picked up on from reading the research before'; 'Mary makes an important point that...Perhaps if I had thought about this I might have been a little less irritated by...'; 'I had originally thought that...but then I was shocked that I hadn't spotted what [Angelique] had. Your conclusion was spot on' and 'Mary and Annie mentioned the value of...and this made me consider this phrase in a way I had not done before'. A further dimension to this revisiting of ideas caused by peers' contributions, is the effect of reading the postings over time and returning to the discussion: 'Initially Oscar's arguments seemed a little harsh..., but on reflection I tend to agree with a range of points put forward'; 'I was also initially quite surprised at Oscar's remark...Actually I think he's probably right in that...'; 'Linda's idea ...at first I thought was a bit too idealistic and possibly unnecessary, but the more I thought about it the more it seemed like a good idea...' There is a clear sense that time to think has affected the development of ideas, and the practice of responding allows the

revision of meanings to become tangible and shared. Variables of reconsidering views were based entirely in collective practice.

Creating 'what if'/hypothetical scenarios

Four hypothetical scenarios were offered in total. They are creative and imaginative departures within the texts, and present alternative views of real-world practice: one is a fictional job advertisement for an invented post; one is a suggestion that teachers should be able to emulate surgeons, 'where after a number of years, teachers would have the opportunity to teach and research in other schools'; one offers a proposed remodelling of the NQT year and one jests about producing research reporting on her own 'emotional turmoil in the classroom'. Each is entirely novel in terms of actual current policy and practice, but is entirely feasible within a revised conception of teachers' professional knowledge and the contexts in which it might develop.

The contribution of 'meta-level engagement' to a theory of teachers' learning can be summarised by the following points:

1. Adopting oppositional viewpoints is accepted as a feature of the group discussions.
2. Participation in the discussions is constituted in difference.
3. Commenting on how the teachers are learning involves both personal and collaborative experiences, and metaphor-building, to share the sense of this with the group as a 'journey'.
4. The discussions are conducted without reference to the tutor. Queries about the course are debated among the teachers themselves. 'Authoritative' answers are not as important as the debate.
5. Participants' comments cause their peers to revisit original ideas and revise their thinking.
6. The time lag within CMC is important in reviewing initial ideas and allowing for revisions which are founded on reading and reflecting over time on what others have written, and then returning to the forum to modify original ideas.

7. Alternative realities of practice are envisioned and projected using imagination and creativity to communicate more radical ideas.

5.4.3.3 Analysis of category: teacher narration

Critical incidents

Critical incidents were used in a variety of ways. Only one of them was a fully developed incident which was contributed as a basis for collective learning, in which an account of an incident on a training course ended with a paragraph inviting the group to share in her reflections, beginning: 'So, where do we go from here?' Incidents were mostly used as 'illustrative tales', to express an already existing perspective, or 'teach a moral'. The first one sums up the point of the 'tale', from which the writer has already developed conclusions which are delivered as the meaning of the incident: 'Research has no value if it's tucked away, undiscovered and not disseminated'. Others are used to substantiate values already held: 'I was horrified only a few days ago when the boys in my year 11 class had absolutely no idea of what verbs, nouns and adjectives are' or to open up critical perspectives 'was there not a better way to spend my time?' and 'the co-ordinator passed it all on without questioning it (even though she obviously was questioning it)'.

Situated accounts/episodes

These variables establish contexts for commentary, and act as situated reference points for views and concepts of practice. Thus 'in our school we plan in year groups' provides a practice-specific context for the comment 'where we reflect on what activities or techniques work well, and which do not, which is quite supportive to each other and hopefully improves pupil learning'. This can also be to make a negative point. Thus, locating practice 'in a school currently overwhelmed by new initiatives', one variable states that 'problems can occur due to a "state of overload"'. Other situated accounts are located in the specificities of school routines and events: 'the recent teachers' strike, teachers in childless schools...'; 'the cold hall [INSET] scenario' and 'when the Research Forum was launched here in [LEA]'; or they reveal 'snapshots' of practice in busy schools: 'The sharing of ideas

relating to teaching and learning strategies is often disseminated via spontaneous conversations during a rushed lunch break'.

Reflecting on teaching

These variables have a reflective focus on teaching itself and are based on reflecting on the recounted actions. These variables only appeared in T1. They reflect a range of classroom practices which are offered on an assumption that the group recognise them with specialist terms like 'questioning skills' and 'writing compositions'. The variables include accounts of problems encountered and solutions where they were found. The problems include: teaching boys who 'lacked motivation' and were 'more interested in reading comic strips'; teaching 'children who have had poor literacy skills'; and the 'difficulty' of 'effectively teaching questioning skills'. The narrated solutions are based on strategies aimed at increasing pupil motivation, reviewing the purpose of lessons, and devising teaching resources. One variable offers an account of a model for reflection for pupil and teacher learning based on a theory of change, and thus introduces an explicit theoretical source to the variable: 'When target-setting with students I often use a model...called the Six Stages of Change...' These shared accounts of actual teaching and actions taken to improve it are contained to T1.

The contribution of 'teacher narration' to a theory of teachers' learning can be summarised by the following points:

1. An initial focus on 'swopping' stories from the classroom and hints on how to improve is replaced after the first discussion by a more conceptual focus on practice.
2. The hints and tips are based on operating within 'grand narratives' of 'improvement' and deficit analyses of under-performing pupils. In the first discussion, the teachers establish their competence in being able to develop strategies for dealing with these obstacles, e.g. boys as reluctant writers, the lack of effective grammar teaching and target-setting. There are no occurrences of this in

the second and third transcripts, suggesting there is a shift in perception about professional learning and practice.

3. A repertoire is established, but not of classroom hints and trouble-shooting ‘tips for teachers’. The repertoire is based on diversity among the teachers, and direct ‘swopping’ becomes redundant. The repertoire that emerges is of different ways to work together; ways of seeing future practice; altered systems; and querying perspectives. This is the knowledge base, and shared practice needs to be seen from this perspective, as there is little to suggest that ‘practical’ skills are being transferred separately from this.
4. The teachers are prepared to offer their histories from the classroom to the group. There is no way of knowing how these histories are shaped by the authors’ intentions, and they should not be mistaken for fact. They are however, a form of ‘verisimilitude’ and are used to develop thinking and the culture of talk within the group and thus are the basis for learning.

5.4.3.4 Analysis of category: scaffolding

Asking a question

The variables for ‘asking a question’ contribute consistently to an ongoing process of negotiation of meaning among the participants. They focus on a conceptual item and problematise it, or suggest viewing it from a different perspective, so that its meaning is disputed. There are numerous examples of this: ‘I do agree that some research is valuable to some, and other research is valuable to others. But why?’; ‘Does there have to be more ‘value’ than this?’; ‘why should you need the actual data if you then went on to say that it may not necessarily be true?’ The questions address: developing new domains of knowledge and learning how they can be discussed, e.g. research literacy; concepts of professionalism: ‘do teachers gradually become sceptical and unaware of opportunity?!’; contemporary systemic conditions: ‘...is this because there really is too much to get done in a limited space of time?’; implications for course participation: ‘Will it be OK to adapt the checklist slightly...[for] the research pieces that we will be expected to do...?’ and

critiquing CPD contexts: ‘How often are we as teachers told or given the research to back up why *change* is occurring, or a new *initiative* being introduced? If teachers were more involved in the research that underpins such *changes* do you think they may be more receptive? [original italics]’. In T3, the variables include two examples of more propositional questions, which suggest meanings and offer them to the group: ‘I wonder if it is a question of becoming more outspoken, in other words less accepting of what we are told?...’ and ‘I thought that if the pendulum were to swing too far, we may move back to the days pre-National Curriculum. How do we feel about that??’

Answering a question

There is only one variable for this, and it comes in T1. It is in fact, a rebuttal of the need to answer questions: ‘I would like to suggest that perhaps you don’t always need to find all the answers’. No actual ‘answers’ to any to the questions asked were given.

Echoing/repetition

Variables of this type make the cohesive aspects of the discussions explicit. They indicate directly that a word or phrase, which conveys a concept, has been taken up from earlier in the discussion and used in a way which helps develop or refine the thinking of the individual and the group. The echoing is both of the author’s own previous words: ‘Does this not return me to one of my previous points, the value of something is a personal thing[?]’ and of others’ ‘Consequently, I strongly echo Dave...’ The echoing reinforces the collaborative aspect of the thinking, and attributes new refinements made by individuals to the original concept offered by someone else: ‘...I do still spend a lot of time feeling how Mike described; “getting through rather than doing the job well”. Is this because...’ Repetition is used to offer an interpretation of another person’s word: ‘Greg uses the term ‘lazy’, suggesting that many who oppose change do so through fear of work’. These variables also offer an echo of the ‘group’ view: ‘as many of you also mentioned’ and ‘as we all have stated, and discussed’, which establishes a bond between the members and projects a collective conceptual stance. Repetition is finally used to take up a term and use

its interpreted meanings to build a conceptual argument, here where the word ‘inflicted’ acts as a signifier for an oppressive process, and prompts an alternative view of challenge as opposed to passivity for teachers’ CPD: ‘I could relate to Angelique’s comment about change being ‘inflicted’ upon teachers [...] I believe teachers are initiating change all the time through being reflective and receptive whereas change that is ‘inflicted’ upon us is unwelcome as...As professionals we should feel able to question change and not be content with having it ‘inflicted’ upon us (Angelque’s term).’

Modifying/augmenting ideas

The ideas contained within these variables contain explicit references to their dependence on a previous idea. There are examples of augmenting ideas by offering a suggestion in relation to a problem: ‘I agree that pupils tend to question very little either. I guess one way to do this is to ensure that...’; by offering a qualification to an assertion: ‘Jenny... says that she often evaluates new initiatives and at times changes them to suit her needs. I guess we are lucky to be in the position of “experienced” teachers who perhaps have the confidence to know that this would work’; by offering a logical progression from the original idea to the next: ‘This may explain why ...’; by presenting an argument: ‘The post from Angelique highlighted the need...Not only could this...but...Therefore...’ and by presenting a balanced assessment of the implications of the idea: ‘Jane’s idea...sounds good. But others might not be bothered...’ As opposed to arguing for the correctness or ‘logic’ of a new idea, some of these variables also present ideas as provisional and indicate that the writer is pondering how to modify: ‘I do wonder if...’; ‘This could be a reflection...’; ‘One of the perspectives that one might approach...’; ‘I don’t think that this necessarily...’; ‘I’m not sure again, that this matters’. Thus variables containing evidence of the modification of ideas include content referring to the process of constructing the modification, as well as the changed idea itself

The contribution of ‘scaffolding’ to a theory of teachers’ learning can be summarised by the following points:

1. Knowledge-building in TPL does not take place through answering questions. Questions are addressed and concepts raised are explored, but ‘answers’ are not forthcoming. The intellectual practice is of negotiating meanings, but participants do not settle on ‘answers’. Where a consensual meaning emerges, it is not referred to as an ‘answer’, but frequently a participant reflects what has been understood about the concept, in the vein ‘it seems we have agreed that...’
2. Knowledge is in the form of an emergent understanding they have made, rather than a pre-existing answer they have discovered.
3. Community aspects of the group make explicit the conceptual cohesion between members, and directly attribute the refinement of ideas to the original input of others.
4. Meaning-making occurs around signifiers which emerge from discussion, by which words become a catalyst around which a concept is built, based on the individual meanings which the teachers bring to the word.
5. Meaning-making is the result of participation but is also an act of participation, as the new concepts are offered back to the group and the whole of the thinking is made available for others to read and interpret in turn.
6. Meaning-making is an explicit practice among the teachers, where they comment on the process of thinking. This indicates that meanings are provisional.

5.4.3.5 Analysis of category: argumentation

Proposing a new idea

These variables include examples of the teacher adopting a position: ‘I maintain that...’; ‘I personally believe that’. The proposed idea is often provocative and adopts a stance: ‘department meetings should be much more philosophical’ and ‘until such a time when real importance is given to those involved in the job, at the front line, then there will never be a place for sharing examples of educational research’. Some proposals are for direct action: ‘If this argument is so persuasive, maybe it needs to be presented to the member of SMT [Senior Management Team] responsible for staff development’; others are for imagined

futures, such as proposing the creation of a post for research co-ordinator, or revising the NQT [Newly Qualified Teacher] year.

Agreeing

There was a pattern in agreement over the three transcripts. Each contained many manifest variables of agreement. In T1 however, nearly all the variables follow a pattern of two sentences, the first being a statement of agreement with another person's idea, followed by the second which was a validating statement, in which the participant added emphasis and veracity of the initial idea, resulting in a sense of 'justification' for the agreement. In T2 and T3 however, there were examples of more than one pattern, and these included a variety of caveats to an original statement of agreement. Most agreements in T2 and T3 are followed immediately with qualifying statements: 'I agree that...However, I would go on to say that...' or 'I would agree with this, but I do not perceive this to be a problem...', or develop the ideas to take on a new conceptual angle, e.g. 'I agree with Mike and would broaden his comment by saying...' and 'I agree entirely...This doesn't mean that...though' After the first discussion, 'agreement' becomes a more complex form of participation, and is not a straightforward concurrence. Independent assertions, disputations and developments follow on directly from an initial agreement.

Disagreeing

Although there were far fewer examples of explicit disagreement than agreement, the point has been made that many examples of agreement built in caveats and qualifying statements to express dissent, so the imbalance between agreement and disagreement is not so great as appears in the coding. Variables of explicit disagreement are mostly in the form of a pattern consisting of a statement of disagreement followed by an explanation in one or two sentences of the justification for holding a different point of view. A small number express disagreement by expressing strong reservations or criticism of another person's view: 'I think the post would be an enormous undertaking' and 'I would be uncomfortable personally with Angelique's...'

Illustrating/giving examples

Variables of this are taken from a range of contexts. Although most are school-based: ‘the English teacher’; ‘the teacher who...’ and ‘read[ing] a report’; although two contain examples drawn from personal/ family situations to support their views, (coping as a single parent and making the effort to attend the gym) and one was from the MTeach course ‘the last meeting of the tutorial group’.

Using rhetorical devices (exclamations, humour, mock-expressions, metaphors, rhetorical questions)

Manifest variables of rhetorical devices include the following types: exclamations: ‘Bet you do!'; emphasis through capitalisation: ‘I definitely NEED answers to questions'; rhetorical questions ‘...would it have been very good research, with which we couldn't argue?'; assumptive sentence structure: ‘Is this not why,...?' and metaphors: ‘INSET days are viewed as something that has to be done (almost swept under the carpet)'. The effect of the rhetoric is that these variables are not invitational of further discussion. The content has a sense of completion, even triumph, and effect a sense of closure on the idea.

The contribution of ‘argumentation’ to a theory of teachers’ learning can be summarised by the following points:

1. ‘Agreement’ does not imply concurrence or lack of debate about the meaning of professional phenomena. Meaning is not fixed by ‘agreement’ with a peer, or within the group as a whole.
2. ‘Agreement’ is frequently a spur for further thinking by the participant, and this grows over time, so that by T3 members are rarely just ‘agreeing’ with an idea.
3. The desire to convey a stance results in a range of rhetorical and illustrative devices being deployed.

4. Argumentation in this CMC practice is not dependent on iterative conversational discourse. There is ample evidence that conceptual work located in ‘argumentation as joint inquiry’ (Koschmann, 2003, p. 265) takes place as a practice, rather than as a genre recognised by adversarial positions in an iterative dialogue between those holding oppositional views.

5.4.3.6 Analysis of category: community-building

Empathising

These manifest variables contain two types of empathetic content, one based on empathising with views and opinions, e.g. ‘I could relate to her views’, ‘Thank you Neil for airing my views...so precisely’ and ‘I too was of the same opinion’; and the other having empathetic experiences: ‘as if he is truly ‘one of us’ and thus really understands what we experience in a day’ and ‘This course is...proving a very positive experience’. These variables establish bonds between individuals, based on articulating a shared professional stance towards practice and how it is talked about. They also establish a collective sense of mutual understanding, which is occasionally explicit, but also conveyed in tacit terms – what it is to be ‘one of us’.

Seeking peers’ views

There are only two manifest variables which explicitly seek peers’ views by asking for a response: ‘I would be interested in other people’s views on this’ and ‘Does anyone else feel like that?’ An invitation to reply is however contained in many other variables, through the use of questions for example.

Expressing mutuality

These manifest variables include many statements in which the teachers identify themselves collectively, in which they express solidarity as professionals and as a group:

‘as teachers undertaking further studies’, ‘this focused group of people’, ‘as a group of experienced teachers’, ‘we as teachers’, ‘as teachers’, ‘as professionals’ and ‘those of us at the chalkface’. They identify themselves in these variables through what they do, and their identity as teachers and professionals, conveyed by the collective pronouns ‘we’ and ‘us’, is binding. Many of the variables include assertions that the group has a high level of consensus, despite variables in other categories which revealed a degree of disagreement and a high value placed on individual difference: ‘the overall impression I share with other group members’; ‘many of us agreed’; ‘we all sort of agreed’; ‘as we have all stated’; ‘most in the group would agree’; ‘most of us seem to regard...’ and ‘most of us believe’. The variables also contain several examples of showing active interest in the postings within the group as a whole: ‘I certainly enjoyed reading through the ideas that everyone put forward’ and ‘I felt compelled to read other people’s response to the same piece...I wanted to find out how the same piece of research had been interpreted by others’. It is clear that they view the group as according its own meanings to the discussion topic. One variable expressed the impact the group has made on a participant’s thinking through the postings and ‘the way in which they have made me think some more, not only about the research in question, but also about my own initial response to it’. The variables also showed the relevance and value of what other people wrote: ‘I thought it would be useful to consider how other people in the group interpreted and valued this research’ and ‘I found it interesting, thought-provoking and informative to read everyone else’s contributions’. Many variables contain direct, positive references to individuals as making useful contributions which affect others. One of these states that another response had had a rallying effect: ‘I really enjoyed reading the piece by Jane, this piece read as positive, constructive and forward thinking where as I had let myself get a bit pessimistic’. Mutuality is also developed around shared aims and purposes: ‘As professionals we should feel able to question change’, and ‘we must use the children’s interests as starting points...’.

Social bonding

These manifest variables have content which establishes informal relationships within the group. They are aimed at putting people at their ease and avoiding misunderstandings in the

online context where participants cannot see their peers. They are frequently self-deprecating, e.g. ‘Sorry for the miscellaneous collection of off-the-top-of-my-head comments’ and ‘...if the comments I make jump around a bit I apologise’ and contain brief references to participants’ personal lives, e.g. ‘(I know it’s early but I’m off to Rome tomorrow)’ and ‘only my parents and my doctor call me Mary, but as long as it’s not offensive...call me what you will!’ and establish them ‘as people’ who are approachable. They offer explanations for people’s actions within the group which may not otherwise be understood: ‘I had written ‘Dave’ a few times in my response, but then I saw that you may also be Angelique. I don’t mind who (or what gender you are), but I decided to take out the names!’ and ‘I really liked the idea (I can’t find it now, think I might have deleted one, sorry - apologies to the author...’.

The contribution of ‘community-building’ to a theory of teachers’ learning can be summarised by the following points:

1. What is socially binding is the shared sense of collegiate professional identity and mutual knowledge and understanding of what the job entails.
2. The group makes explicit its investment in the writing of its members as a source of shared professional understanding and learning i.e. meaning-making.
3. Community-building involves conveying a sense of being ‘real people’ within the online discussion.

5.4.4 Building a theory of TPL and CMC based on the manifest variables

5.4.4.1 Re-reading the manifest variables

A theory of TPL within CMC was developed based on this analysis of the manifest variables. Each category yielded the analytical points made in sections 5.4.3.1 – 5.4.3.6, thirty-five in total. It is important to the case approach to make “the move from describing ‘what happens’ to explaining ‘why does this happen?’” (Schostak, 2002, p. 87). In this case, the shift was from identifying that cognitive and social presence ‘happens’ or exists,

to explaining what impact CMC has had on how they are present in the ways identified. It has already been acknowledged that the nature of the course task will impact on conceptual presence, so the aim was to focus on what can be found as a link between practising CMC and the elements of learning which have been identified.

At this stage there was a danger of ‘relentless abstraction’ and Schostak’s warning to ‘keep close to the data’ has been central to developing an approach to theory-building based on the manifest variables. This is the stage where Eagleton’s emphasis on ‘constant focus changing’ (2003, p. 53) in textual hermeneutics had to be reconciled with the need for the case to build situated knowledge, by which the context and purposes of the research must remain central, and remain rooted in the teachers’ practice-based participation in the MTeach discussions. Having worked closely with the manifest variables to arrive at an understanding of ‘what happens’, the transition to examining ‘why does this happen?’ was therefore begun through the analytical points which capture the features which emerge from the descriptions, thus staying ‘close to the data’.

On beginning the next stage, I needed to ‘pull back’ (Eagleton, *ibid.*) a stage further from the text itself to consider the theoretical underpinnings of ‘what happens’. To do this, I needed to view the points synoptically. Garrison and Anderson (2003) emphasise the need for each context to be treated as ‘specific’, and as researcher, I needed to develop an approach to developing the theory which allowed me to work with the details of this particular context and the way the variables emerged. To do this, I read the analytical points made about each set of manifest variables together in the table format which follows. This different context pulls together the analysis of ‘what happens’ in the three discussions. This is the new stage of interpretive work, which ‘fills with content’ (Kress, 2003) the manifest variables, thereby shaping the data, and is the essence of the approach to developing a theory at this stage. The table below therefore captures the analytical points made in the previous sections, and provided the basis for theory-building:

Identity-building	
1	The use of specialist language establishes membership of this group.

2	'First order' (Laurillard, 2002) ways of knowing are readily accessible to the teachers.
3	Experience becomes problematised as a foundation for professional learning.
4	Counter-narratives disrupt 'grand narratives' around INSET days, Standard Tests for pupils and government initiatives as unquestionable 'truths' which lead to improvement.
5	The concept of collaborative professional identity starts to disrupt beliefs that personal choice and individual difference are sufficient as a foundation for practice.
6	Explicit political discourse is a disconcerting concept for the teachers, despite the oppositional stance which develops towards contemporary systemic constraints on teachers' practice.
7	Practice moves from prescriptive certainty to negotiated uncertainty.
8	The struggle of coming to terms with an uncertain practice is considerable. Taking responsibility for professional thought and action is not something that all the teachers find a desirable aspect of their identity.
9	Oppression is conveyed in the term 'inflicted' which has been repeated from another message. It suggests that teacher identities are constituted in oppression and conflict (external factors) as well as personal differences (internal factors).
10	Teacher identity is constituted in difference but is linked to core values aimed at improving pupils' learning.
11	These teachers articulate practice as involving the exercise of critical thinking and developing judgements as intrinsic to 'the nature of the job'.
Meta-level engagement	
12	Adopting oppositional viewpoints is accepted as a feature of the group discussions.
13	Participation in the discussions is constituted in difference.
14	Commenting on how the teachers are learning involves both personal and collaborative experiences, and metaphor-building to share the sense of this with the group as a 'journey'.
15	The discussions are conducted without reference to the tutor. Queries about the course are debated among the teachers themselves. 'Authoritative' answers are not

	as important as the debate.
16	Participants' comments cause their peers to revisit original ideas and revise their thinking.
17	The time lag within CMC is important in reviewing initial ideas and allowing for revisions which are founded on reading and reflecting over time on what others have written, and then returning to the forum to modify original ideas.
18	Alternative realities are envisioned using imagination and creativity to communicate more radical ideas.
Teacher narration	
19	An initial focus on 'swopping' stories from the classroom and hints on how to improve is replaced by a more conceptual focus on practice after the first discussion.
20	The hints and tips are based on operating within 'grand narratives' of 'improvement' and deficit analyses of under-performing pupils. In the first discussion, the teachers establish their competence in being able to develop strategies for dealing with these obstacles, e.g. boys as reluctant writers, the lack of effective grammar teaching, target-setting. There are no occurrences of this in the second and third transcripts, suggesting there is a shift in perception about professional learning and practice.
21	A repertoire is established, but not of classroom hints and trouble-shooting 'tips for teachers'. The repertoire is based on diversity among the teachers, and direct 'swopping' becomes redundant. The repertoire that emerges is of different ways to work together; ways of seeing future practice; altered systems; a querying perspective. This is the knowledge base, and shared practice needs to be seen from this perspective, as there is little to suggest that 'practical' skills are being transferred separately from this.
22	The teachers are prepared to offer their histories from the classroom to the group. There is no way of knowing how these histories are shaped by the authors' intentions, and they should not be mistaken for fact. They are however, a form of 'verisimilitude' and are used to develop thinking and the culture of talk within the group and thus are the basis for learning.
Scaffolding	
23	Knowledge-building in TPL does not take place through answering questions.

	Questions are addressed and concepts raised are explored, but 'answers' are not forthcoming. The intellectual practice is of negotiating meanings, but participants do not settle on 'answers'. Where a consensual meaning emerges, it is not referred to as an 'answer', but frequently a participant reflects what has been understood about the concept, in the vein 'it seems we have agreed that...'
24	Knowledge is in the form of an emergent understanding they have made, rather than a pre-existing answer they have discovered.
25	Community aspects of the group make explicit the conceptual cohesion between members, and directly attribute the refinement of ideas to the original input of others
26	Meaning-making occurs around signifiers which emerge from discussion, by which words become a catalyst around which a concept is built, based on the individual meanings which the teachers bring to the word.
27	Meaning-making is the result of participation but is also an act of participation, as the new concepts are offered back to the group and the whole of the thinking is made available for others to read and interpret in turn.
28	Meaning-making is an explicit practice among the teachers, where they comment on the process of thinking. This indicates that meanings are provisional.
Argumentation	
29	'Agreement' does not imply concurrence or lack of debate about the meaning of professional phenomena. Meaning is not fixed by 'agreement' with a peer, or within the group as a whole.
30	'Agreement' is frequently a spur for further thinking by the participant, and this grows over time, so that by T3 members are rarely just 'agreeing' with an idea.
31	The desire to convey a stance results in a range of rhetorical and illustrative devices being deployed.
32	Argumentation in this CMC practice is not dependent on iterative conversational discourse. There is ample evidence that conceptual work located in 'argumentation as joint inquiry' (Koschmann, 2003, p. 265) takes place as a practice, rather than as a genre recognised by adversarial positions in an iterative dialogue between those holding oppositional views.
Community-building	

33	What is socially binding is the shared sense of collegiate professional identity and mutual knowledge and understanding of what the job entails.
34	The group makes explicit its investment in the writing of its members as a source of shared professional understanding and learning i.e. meaning-making.
35	Community-building involves conveying a sense of being 'real people' within the online discussion.

Table 5.7 Analytical points derived from the manifest variables

These points were read to establish a theory of TPL which 'stays close to the data'. It is informed by the data, my reading of theoretical perspectives on TPL based in community and agency, and by the process of inquiry itself. The theory evolves in four themes which examine the issues that were highlighted in Chapter 2 (2.3.2.6) as key to identifying community dimensions of TPL within CMC: What is socially binding in this CMC context? How do 'ways of talking' contribute to TPL? How is meaning-making in this group reflective of learning within a COP? What type of learning emerges, in terms of agentive and critical identities?

5.4.4.2 A theory of TPL within CMC in the case context

In this section, I project a theory of TPL within CMC in the case context, which contains four parts. From each part, latent variables of TPL within CMC are derived and represented in a short following stage which completes the application of the QCA model.

SOCIAL BONDS

CMC as a practice involves learning with and through others. Although social bonding outside of the discussion focus can occur, there are few purely social postings, and the strongest social bonds are to do with binding the teachers as *thinking participants*. Shortage of time is a recurrent theme in the online writing, and effort devoted to purely social bonding is minimal. It is the conceptual work which binds the participants together as

sharing a learning experience, rather than purely social engagements. Establishing themselves as ‘real people’ is not dependent on a broad spectrum of social facets. They are ‘real people’ in this context *because they are real teachers*. It is the *authenticity* of their accounts of practice which establishes them as real and as valid participants with whom it is possible and productive to discuss ideas. The processes which are socially binding combine procedural with cognitive practices as learning. They explicitly serve the purposes of confirming the learning practices which they engage with, and which are shared among the group. Procedural processes reveal insights into *how* they participate in the ideas of others, by: reading peers’ ideas; taking time to consider the significance of what others have said; re-evaluating individual perspectives in the light of this; thinking about how to respond to the discussion from a new perspective; acknowledging the inter-dependence of the ideas which emerge; acknowledging the importance of difference between individuals; assessing the ideas in terms of how far the group has agreed or disagreed. These processes develop as ways to participate and are a form of ‘context-making’ (Hymes, 1994; Jones, 2002). The participants share explicitly the ways in which they are learning as part of the group, and so establish a culture of participation and of how this particular group will ‘be’. This disputes a concept of stages of learning in CMC, by which social bonding is established before conceptual work begins, and also challenges the separation of the social from the cognitive aspects of learning in itself. This supports Koschmann’s theory of argumentation as a form of ‘being’ in CMC, in which arguing *is* learning through ‘joint inquiry’. In this context, ‘arguing’ can be interpreted as projecting a perspective or situated persona within the context of CMC. The teachers are inhabiting a way of being, in which critical inquiry is conducted as a way of talking – the way of talking is socially binding. There is no clear separate effect of social and cognitive presence on conceptualisation. They are interdependent, and thus social bonds *are* cognitive bonds, in that one could not exist without the other in constituting conceptual presence.

‘Argumentation’ in theories about learning in CMC (Andriessen, Baker and Suthers, 2003) has focused on ‘how argumentation can be exploited as a site for learning’ (Koschmann, 2003, p. 261) but such a focus needs to take greater account of the nature of agreement and mutuality in conceptual work. In this case context, mutuality has an important bearing on

how the teachers develop a way of talking. Argumentation and community-building are not mutually exclusive. A shared ethical core and critical orientation towards practice is vital to theories of TPL. This means that a view of TPL based on a ‘conflict’ view of learning is problematic. Resisting fragmentation is a strong driver in learning communities – it underpins the concept of ‘fraternity’ for Sachs (2003a), and of Professional Learning Communities for Lingard et al. (2003), Fielding et al. (2005) and Bolam et al. (2005) (see Chapter 2, 2.3.2.1). The need for community-building is strong for the essence of TPL to be achieved by engaging together in talking about practice – practice becomes thereby a community phenomenon. This does not mean that community perspectives require ‘consensus’ or compliance with ideas, but means that it is important that participants recognise the same experiences as a source of learning. This means learning how to ‘be’ a teacher within this community by the way they talk about practice – this does not mean saying the same things, and they do not. Frequently, agreement is at once followed by a qualifying statement showing an alternative view, or the more realistic consequences of the point which has been made. Teachers build knowledge by modifying each other’s ideas, rather than ‘arguing’ by taking oppositional stances. The agreement is more a kind of acknowledgement that the person has spoken as a teacher – they have a valid point because it is rooted in practice – they know how to ‘talk within practice’ – a lot of the ‘agreement’ is based on this, while the ideas themselves are more often than not, immediately qualified or changed – they do not all ‘think the same’.

WAYS OF TALKING

Iterative conversational exchange is not essential to socio-constructivist learning in this context. Despite a lack of ‘conversational’ format, disagreement and interdependence of ideas develop within the teachers’ online writing. Teachers think and change their minds, as a result of reading their peers’ postings and of writing for them. Talking within practice involves extensive modification of ideas. Despite the lack of conversational format, a great deal of conceptual transformation takes place in examples of scaffolding where the teachers intervene in each other’s ideas. In contrast, there are few examples of introducing entirely new ideas into the discussions, once the participants start to ‘respond’. The messages sent

as responses form a building process of modification and augmentation, rather than of new departures. ‘Joint inquiry’ is learnt as a ‘way of talking’.

CMC has given the time for participants to acknowledge how people ‘talk within practice’ (Lave and Wenger, 1991) within the discussion, in a way which is not necessarily so obvious in the immediacy of face to face transactions. Their talk is part of establishing themselves as practitioners and establishing the meanings of what they do. The capacity of CMC to amplify human abilities to ‘pool...mental resources’ (Mercer, 1995, p. 1) through language in this context is not primarily about using language to arrive at concepts. The pooling of mental resources through language accords more with Koschmann’s interpretation of ‘argumentation as joint inquiry’ and therefore “as a form of learning in its own right” (2003, p. 266). Inquiry as a way of talking contributes to a form of shared professional identity for ‘thinking participants’. Participation in the discussions is constituted in difference, made concrete by the teachers’ individual stories, contexts and scenarios. These provide the basis for situated projections of their practice as teachers. Gradually however, they move away from talk based in ‘experience’ as a sufficient basis for learning, and reflection on teaching and swopping classroom practices diminishes. The ‘ways of talking’ are shaped by the practice of CMC, and time-lag affects thinking and the conceptual activity in the group. They become aware of their ‘ways of talking’ and the ways in which they are naming things with others, and the way the ‘names’ are given jointly. Thus the talk becomes inquiry – an act of negotiating meanings and ascribing ‘thingness’ (Wenger, 1998) to professional phenomena.

It is participation in discussion where the learning happens – the act of inquiry *is* the learning. Argumentation as learning does not require giving or receiving answers, but discussing ideas, and engaging in conceptualisation, and this requires the constant denial of certainty. What they are naming is not the day to day materiality of their practice. They bring this to the discussion and it becomes the basis for another type of naming. That is the naming of processes of inquiry and of the learning process itself. ‘Practising’ as a teacher becomes learning by inquiry. This is the ‘way of talking’ which makes it a COP, because this learning within practice is not constituted by what they *do* but by their talk about it.

This is a core component of their ‘shared repertoire’, one of the three dimensions of a COP by which community is linked with practice (Wenger, 1998). Sachs (2003a) refers to the need for teachers to become activist by ‘harnessing intellectual resources’. Argumentation as inquiry is one such intellectual resource, and it involves ‘harnessing’, and is not a complete, but an ongoing process or stance which CMC can foster and make explicit. To that extent, it would not make a material difference if the discussions involved several levels of iterative response – it is only a segment of an ongoing learning practice. Participation by a ‘way of talking’ is therefore about making a discourse of inquiry. It is not necessarily about achieving answers or becoming expert or knowledgeable within a discipline.

MEANING-MAKING IN A COP

Six processes contribute to the teachers’ meaning-making: identity-building, meta-level engagement, teacher narration, scaffolding, argumentation and community-building. In each process, the teachers are inhabiting a way of talking which establishes them as members of the community. ‘Talking’ involves bringing together both social and cognitive aspects of meaning-making processes, which can be identified on the surface of the texts. They can be identified in the declarative level of the messages, as ‘manifest variables’ of conceptual content. Many of the manifest variables are multiple – there is no clear distinction between social and cognitive presence in terms of what is actually written, only in its interpretation.

The feature which emerges strongly from the analysis is the essential role of participation and reification as *twin* politics for meaning-making in this context. Wenger’s (1998) theory of social learning within a COP rests on these as inter-dependent, and this can be identified within the online discussions. The data reveals how participation and reification are *twinned* by the practice of CMC, i.e. they are inter-dependent and symbiotic and not just co-existing. Analysis of the manifest variables for categories of both cognitive presence and social presence show this. Teachers build a shared stock of interactions which create a context. Wenger’s definition of learning by ‘participation’ invokes not only engagement but

cultural making – it “takes place through our engagement in action and interactions, but it embeds this engagement in culture and history” (1998, p. 13). By reification, “we project our meanings into the world and then we perceive them as existing in the world, as having a reality of their own” (*ibid.*, p. 58). In Chapter 2, I explained this as meaning that “They become markers, by which a community can encode its practices and share recognition and understandings of core phenomena and their political implications for how individuals can act or ‘be’ within that world” (p. 46). The analysis of manifest variables suggests that ‘twinning’ of participation and reification is present in the discussion. Wenger’s argument is that reification produces ‘objects’ that give ‘form’ to experience by congealing it into ‘thingness’ which become “points of focus around which the negotiation of meaning becomes organised” (Wenger, 1998, p. 58). Twinned with this, participation requires shared engagement with ‘culture’ and ‘history’ as a way of talking about practice to enable this to happen. Analysis of the teachers’ online texts gives an interpretive account of these processes as ‘twinned’. These are where the social and cognitive elements of conceptualisation become joined. Analytical points derived from the text suggest that the twinning process is present in the reification of phenomena being discussed:

Community aspects of the group make explicit the conceptual cohesion between members, and directly attribute the refinement of ideas to the original input of others. Meaning-making occurs around signifiers which emerge from discussions, by which words become a catalyst around which a concept is built, based on the individual meanings which the teachers bring to the word. Meaning-making is the result of participation but is also an act of participation, as the new concepts are offered back to the group and the whole of the thinking is made available for others to read and interpret in turn. Meaning-making is an explicit practice among the teachers, where they comment on the process of thinking. This indicates that meanings are provisional (Table 5.8, points 26-29).

The teachers thus ‘give form’ and ‘create points of focus’ in which meaning is negotiated, which can be demonstrated through analysis of the manifest variables. Crucially, the practice of CMC makes the relationship between participation and reification explicit, in the references the teachers make to how they are negotiating the meaning of practice-related phenomena within a shared practice, interacting in order to work with the ideas offered by others. These meaning-making processes blur the distinction between social and

cognitive presence. Although each can be identified in terms of manifest variables, they cannot exist without each other.

LEARNING AND IDENTITY

In making declarations about what constitutes practice and reflecting on it, the teachers' writing indicates that they develop orientations to their practice which reflect what Wenger (1998) identified as developing 'specialized sensitivities', an 'aesthetic sense', and 'refined perceptions' about practice. In order to write about practice, the teachers adopt discourses which can be recognised as the 'reflective practitioner' and the 'competent craftsperson' (Moore, 2004), but these discourses do not provide entirely satisfactory vehicles for enabling the teachers to talk about their experience. Drawing on the discourses of the 'reflective practitioner' the teachers initially make recourse to *experience* as the source of professional identity and learning. At the same time, the discourse of the 'competent craftsperson' establishes inclusiveness within the group and secures a viable professional identity. Expert 'craftsperson' knowledge is conveyed in the use of specialist language and inhabiting the discourses of performativity and improvement, in which the teachers establish themselves as proficient in contributing to the 'economy of exchange and satisfaction' (Standish 2007, p. 2). The use of unexplained acronyms assumes a common store of experience situated in contemporary education policy and practice. Becoming research literate, the focus of the module discussions and not part of the authorised discourse of the 'competent craftsperson' nor the 'reflective practitioner', is seen initially as a matter of personal choice which can be made by knowledgeable practitioners. In further discussions however, the need for alternative shared professional purpose becomes apparent. The variables start to serve disruptive purposes, by containing counter-thinking and voicing criticism of teachers who are not committed to professional learning. A desire for ownership of teaching as a practice with an intellectual dimension emerges, involving querying the role of teachers in the education system and suggesting that they could make more decisions for themselves, based on being critically informed. A need for a collective professional identity which includes this agentive imperative is voiced, although this is regarded with concern by some, based on the uncertainty of the practice which would

emerge. The ‘competent craftsperson’ discourse, in which teachers referred to their knowledge of statutory requirements and their capacities to carry them out well, is altered as the discussions develop. A different sense of a teacher who thinks and acts independently emerges. Despite a concern about being ‘political’, the teachers have been engaging with issues of power in constituting their professional identities and practice. This has informed the ‘reification’ process, by which practice has been ascribed meanings which are less stable. INSET is criticised as not meeting teachers’ needs and a new meaning for this practice is projected by which teachers could learn purposefully from each other and by a hypothetical ‘research –co-ordinator’. The step of ‘inventing’ this post makes concrete an alternative meaning. Teachers dispute ‘government generalisations’ and draw on practice to make this real – ‘quite different trends occurring in our school’. Negotiating meaning becomes explicit, and analogy is used to describe this as a protracted process, as difficult as deciding ‘whether Hamlet was mad’. The teachers project meanings about what they are doing by these creative means – inventing a post, comparing the discussion with interpreting *Hamlet*, suggesting that a ‘philosophical environment’ is needed in which questioning would be core. These ‘ways of talking’ are all disruptive of the discourses of the ‘competent craftsperson’ and ‘reflective practitioner’ which are constituted in the grand narratives of ‘improvement’ and ‘performativity’. Thus the features of developing ‘specialized sensitivities’, an ‘aesthetic sense’, and ‘refined perceptions’ about practice are characterised by struggle and trepidation – wariness of being ‘political’ means they do not have an alternative discourse they can easily inhabit. This wariness can be identified in Moore et al.’s (2002) analysis of teachers as depoliticised within contemporary contexts, and adopting ‘pragmatic’ rather than ideological or political identities as teachers within the discussions. These teachers struggle however, within what can be recognised as a pragmatic orientation to what they do, and therefore what constitutes their identities. They borrow from the discourses which support a pragmatic orientation towards practice, but in so doing they reveal what is inadequate about them. The teachers struggle to find an agentive discourse, and although there is mutuality and community-building in the discussions, there is less evidence of the agentive ‘fraternity’ which Sachs envisages, and the achievement of ‘productive pedagogy’ (Lingard et al., 2003). Orthodoxies *are* disrupted, but not universally, and it is possible to interpret the teachers as being in processes of

accommodation rather than disputation, in their adherence to the notion of individual differences and a concern about what would happen ‘if the pendulum were to swing too far’. The evidence in the text is that they agree there is grounds to dispute orthodoxies, but acting differently is another step. There is evidence of what Fairclough (1992) calls ‘ideological co-option’ in the ways that dissent is neutralised by the overarching narrative of ‘improvement’ which is not disputed in itself, although some of its components are critiqued, e.g. Standard Attainment Tests results as a measurement of pupil learning.

5.4.5. Stage three – identifying the latent variables of TPL within CMC

The latent variables of TPL in CMC are derived from this theory. They are discernible only from the extensive re-reading and analysis of the textual data which has been reported, and are not declared by the teachers themselves, but arrived at inductively and by the theoretical work in previous sections. They form a synthesis of the features of TPL in this context which have been affected by CMC as a practice. They relate to each part of the theory in 5.4.4.2 above.

Social bonds

1. Authenticity (of accounts, of teacher personas, of practice-based contexts)
2. Fraternity (as thinking participants)
3. Inter-dependence (of thinking)

Ways of talking

4. Talking about inquiry
5. Denying certainties about practice
6. Establishing provisionality of ideas

Meaning-making in a COP

7. Twinning participation and reification processes
8. Creating culture

Learning and identity

9. Struggle within available discourses of teaching
10. Disruption of orthodoxies
11. Accommodation

5.5 EVALUATION OF METHODS

This section evaluates the methods used in the QCA model and addresses the third sub-category of the research question which is:

How can electronic discussion be researched?

Throughout this chapter I have reflected upon the application of the methods in practical and theoretical terms, and on how they constitute the case development and the meanings which are derived to answer the research question. It has become clear that in researching electronic discussion, it is the interpretive stance which is key to arriving at a meaningful stage of understanding of what is in the text and, more importantly, why it is there and why it matters.

The process of collating and presenting the online discussions as data involved intrinsic acts of interpretation and analysis at each stage. Before beginning to apply the model, it required interpretive judgements to be made through: reading the online archive; judging which messages are relevant to the research and meet the requirement to investigate social and cognitive presence; organising messages in a word file; and sorting them to create data. Each reading brought me closer to the data, so that I began to develop an orientation towards the meanings in texts before coding even began.

The process of coding involved difficulties which refined my understanding of the complexities of the teachers' learning. Some categories were difficult to code – there was considerable overlap as multiple variables existed within the same text. My understanding of the model has been changed by working with it, and the coding has served to reveal and create complexity, rather than impose an order on the data. The model has enabled me to interpret, rather than limit interpretive possibilities, which was my original reservation about using categorising approaches to textual analysis. Its most important function is to make the reader focus closely on the text, and organise understanding about the text, based on hermeneutical reasoning.

The method did not produce fixed knowledge about the features of TPL. Instead it brings 'I' as the researcher close to the data, which is essential to conducting qualitative analysis. It reveals that the basic premise of separating 'social' from 'cognitive' presence' is a difficult task, and in fact the interdependence of the two emerged from the inquiry as a prime finding. That in itself has therefore highlighted the nature of TPL in context of CMC as a practice – the *inseparability* of the two has emerged as a core finding, out of trying to identify them separately.

My original wariness of applying taxonomy approaches has been revised by this process. Somewhat paradoxically, the grounds for my initial scepticism are upheld – it is impossible to 'identify' learning in an absolute sense, but this is no longer the point. The focus, through which it is possible to understand what is going on in the discussions, has shifted. The research experience has developed my own learning about inquiry as learning, both my own and the participants'. In this way, Koschmann's (2003) theory of argumentation has become particularly relevant to understanding the features of TPL in CMC, where he claims that:

Argumentation provides a site for doing inquiry into the very process of inquiry itself...Adequate attention has yet to be paid...to the methods participants employ in *doing* argumentation. That is, there is a need for research carefully documenting how argumentation is accomplished as an interactional achievement, as a form of enacted practice. (pp. 266-267).

The methodology developed by Garrison and Anderson and adapted for and by the case has been appropriate in ‘paying attention’ to the ways participants ‘*do* argumentation’. It has thereby enabled me to address the two sub-categories of inquiry:

To what extent does participation in an MTeach electronic discussion forum constitute membership of a learning community? Do existing models for describing learning in ‘communities of practice’ satisfactorily extend to the context of teacher learning through CMC?

How do teachers engage with knowledge construction through CMC, and what are the particular features of electronic discussion that characterise this process?

5.6 SUMMARY

This chapter has explored the process of applying the adopted QCA model to analyse the teachers’ online discussions. It has established that inquiry into online discussion is a learning process for the researcher, and has shown the challenges of categorising ‘learning’ and shifted my understanding of the purposes of categorising learning within electronic texts. The features of TPL within CMC have been identified, and I have acknowledged the interpretive choices made at each stage which have helped constitute the findings. I have argued that the conceptual content of the online discussion suggests that the teachers are learning within a COP, in which essential elements of learning within practice as a collaborative practice are present. I have also assessed that the need for agency is not fully addressed, in that the practice is encouraging of counter-discourses and disruptive thinking but that elements of hegemony, ideological co-option and pragmatism all feature in the discussions and curtail the agentive potentials of the online discussions. Agentive teacher identity is compromised, and is not as evident as collaborative identity within the texts.

The interpretation so far has been based entirely on the textual content of the teachers' online writing. The bounds of the case examine TPL within the textual practice of CMC, but there is value in gaining other insights into the transformational effects of participating in the online discussions, including the dimensions of community and agency. The interviews with the teachers, which are analysed in the following chapter, offer such insights and make the final contribution to examining TPL within CMC.

CHAPTER 6: INTERVIEWS WITH THE TEACHERS

6.1 INTRODUCTION

This chapter aims to present the data and analysis based on interviews which were conducted with the teachers during the second year of the course. It establishes the relationship between the interviews and the case development, and analyses the teachers' perspectives on participating in the online discussions and what they learnt. The narrative approach is explained, with reference to treating the interviews as narrative data, and adopting narrative analysis of the teachers' accounts. The chapter explores three themes which emerge from analysing the interviews: peer relations, textual relations and relations of reification. They represent and synthesise the way CMC is experienced in relation to TPL according to the teachers' narratives. The chapter includes reflection on how these themes recontextualise the analysis within the case so far. Finally, I evaluate the contribution of the narrative data within an analysis and synthesis of the case.

6.2 THE NARRATIVE APPROACH

6.2.1 The dual role of narrative in interviews as experiential data

A narrative approach is used to explore the contribution of the interviews as providing experiential participant perspectives to the case. This involves using narrative approaches in two ways: treating the interviews as learner narratives which can reveal aspects of the teachers' learning; and using narrative analysis as a research tool by which to understand the interview transcripts. Narrative is a way of engaging qualitatively with experiential data. Cortazzi (2001) has argued that narrative can enable understanding of learning experiences from this dual perspective, of both the learner and the researcher. For the learner, constructing narratives is a way to "organise and interpret experience and communicate it memorably in social contexts. In several ways, narratives make sense and give coherence to our personal and professional lives" (ibid., p. 1). Thus the teachers' narratives provide accounts in which the teachers have organised their experience of CMC

and TPL in particular ways, to make it meaningful to them and communicable and comprehensible to me as the researcher in the social context of the interview. For the researcher, “narrative analysis can offer particular insights and challenges regarding concepts of context, interviewing, participants’ accounts, representations of meaning, and performance in research” and is particularly applicable to “the construction and representation of teachers’ experience and development” (*ibid.*). The insights gained from narrative approaches to teachers’ experiences of learning within CMC bring a further dimension to the case as a ‘complex’. The teachers’ interviews about being involved in online discussion offered their unique interpretations of CMC as a lived practice, that is both individual and social. The challenges for analysis, as indicated by Cortazzi, are already familiar within the case, and involve addressing the ‘believability’ of narrative as data, and the validity of qualitative interpretation of narrative texts. In adopting a narrative approach to the analysis of the interview transcripts, this chapter continues the interpretive stance towards textual data which underpinned Chapter 5, in which all texts are treated as ‘an instance of something else’ (Brown and Dowling, 1998). Now however, there is a double layer of qualitative interpretation in the case, in the teachers’ constructions of their learning as narratives, and in my interpretation of them. To interpret the narratives, this chapter draws on the significance of Bruner’s (1985) work on ‘the meaning of experience’ and his arguments for ‘believability’ that is based on experience. He argues that narrative is a ‘mode of thought’ – that is, a way of knowing, of understanding, that is based on our ordering of experience or ‘filtering’ of the world as we encounter it. It seeks explanations of the world, or ways of understanding, which are rooted in the contexts in which events occur. Such contexts are particular to time and place, and thus offer ways of ‘knowing’ that are different from attempts to establish constant logico-scientific and empirical ‘truth’. Bruner is interested rather in ‘verisimilitude’ or ‘truth-likeness’ in the narratives which individuals construct in order to organise their experiences in order to make sense of them. The sense – or meaning – of such a narrative is rooted in its ‘believability’ rather than the absolute authenticity of events. Factual accuracy is less important than the understandings which are derived from engaging with the narrative. The narratives can contain internal contradictions and inconsistencies. I am not interpreting the ‘truth’ of what the teachers tell as an accurate representation of the reality of what they learn. Rather, I am interested in

what Bruner claims individuals can come to know, think and feel through their engagement in the ‘landscape of consciousness’:

In logic and in science you attempt to mean what you say. In narrative, to be successful, you mean more than you say and treat a text or utterance as open to interpretation rather than literally fixed with, so to speak, the “truth in the text”. (1985, p.109).

This is largely what is meant by ‘implicature’ – the significance for the researcher of what is said lies in its expansive meaning, which is rendered by interpretation.

The teachers offer two forms of narrative in their interviews – explicit narrative ‘tales’ in which they talk *about* practice and choose to tell about events, contexts and individuals in coherent and crafted ways which we recognise as adhering to narrative forms (Polkinghorne, 1988) so that they are comprehensible. An example of talking about practice is: “ I remember, I think it was Joyce, when she talked about her little journals that she kept – the way she put things on the board each day, and – I can’t remember the exact things she did, and I just remember thinking yeah, I really liked talking to her and about the way she did things and in an admiration way if you like, I’m thinking that is really professional and I’d like to be able to do things like that as well” (P3). Here, P3 narrates a remembered experience of interacting online with Joyce, and recreates within the interview the feeling she had at the time of ‘admiration’ and the perceived value she attached to the experience. It is an experience of a learning practice ‘relived’ and recreated through the narrative, and relies on what Polkinghorne (1988) calls ‘narrative form’ to create the meaning of the experience. But the teachers’ narratives also take another form, by which they are also ‘talking *within* practice’ (Lave and Wenger, 1991), in which they narrate their views and reflections on events, and these narratives construct the teacher’s world for us through the ways they position themselves as acting or being in a social context. Thus these narratives work by what Polkinghorne calls ‘narrative function’. An example of talking *within* practice by P3 is: “...to build in your views, erm you kind of do your reading, erm you know, think about it, look into that particular area, and you form your own views and opinions, so without – I think in a way for me it was better than face to face discussions because it gave you a chance to think about in more detail...”. The teacher uses narrative

here to *explain* an experience and give an insight into it, and the narrative contains evidence of the construction of this in its reflective stance. This is not a *relived* experience which is already in her consciousness in that form, and the teacher must think about what the narrative will say about the experience. It is a form of thinking out loud about what has happened, in order to render it meaningful to the speaker as well as the listener. Both of these types of narrative exist within the teachers' interviews, and remind us that what is said is not necessarily what *is*. It is only an instance of an experience, crafted at that particular time by the context of the interview itself and all the relations therein between myself as tutor-researcher and the respondent as teacher-participant (see Chapter 3, 3.2.1 where I examine how "myself as the researcher immediately disturbs the taken-for-granted flow of relations between myself as the tutor with my students" in relation to the impact of ethnographic elements within the research). Thus, the 'truthfulness' of what is said lies in my interpretation of their acts (both conscious and unconscious) of narration within the social context of the interview, as well as within my stance towards CMC and TPL, developed within the rest of the case. In Chapter 2, TPL was identified as having 'agentive' and 'community' dimensions, which make it possible to develop as a critical and reflexive practitioner, by which a teacher's individual development is constantly in interplay with peer experience and dialogue. The impact of CMC on this conception of TPL has been examined through QCA of the online texts written by the teachers. This has rendered an interpretation of the conceptual content of their online writing as containing four elements which link TPL with CMC as a social practice involving social bonds, ways of talking, meaning-making in a COP and learning and identity. The teachers' perspectives on this practice in this chapter however, form a further contribution to the case. They return me to the context – a group of teachers, engaging in a mixed-mode masters degree, which requires them to participate in an unfamiliar social and literate practice. What is written online is only one representation of the impact of CMC on TPL. Their interview accounts offer a further narrative, and refocus the case, to remind that the categorisation of TPL on which the QCA model was developed is challengeable, and a construction. I needed to examine for agency and community in *their* perspectives of CMC as a practice, and address the potential differences between what is interpreted from the online writing, and what is revealed in this different socio-communicative context.

6.2.2 The interviews as narrative data

In Chapter 3, I explained the interpretive stance towards the interviews with the teachers, by which they are constructed accounts of their experiences of CMC. They are intended to explore the teachers' perceptions of participating in CMC and the relationship between this practice and their learning. Eliciting narratives from the teachers through the interviews is part of the qualitative stance which shapes the different aspects of the case. The interviews prompted the teachers' *constructions* of what happened to them, and are built around their interpretations of the practice they have engaged with. They are thus outside of the 'naturally occurring' data which forms the basis for previous stages in the case, based on the texts which they wrote as part of the course.

The 30 minute interviews were structured around six experiential themes which invited the teachers to give qualitative responses by reflecting upon their experiences of participating and learning as teachers within CMC. The six question themes were: the effects of prior experiences of e-learning; participation in the online forum; writing to each other online; being part of a community; describing the learning in the online exchanges; and the relationship of the learning experiences to notions of teacher professionalism (see Appendix II, the interview schedule). These themes aimed to allow for a range of emphases to be explored and expanded according to personal experiences and interpretations. Each of them formed part of a framework for the interviews because they involve the teachers in considering issues related to 'joint thinking' and 'meaning-making' in TPL and to the agentive dimensions of this (see Chapter 3, 3.4) and thus allow for further exploration of the research question, what is the impact of CMC on TPL? The questions aimed to allow the teachers to present their perceptions of both individual and social aspects of learning with CMC. I adopted what Decortis (2004) has called a 'constructivist' approach to the interviews as narrative data. There is a considerable range of perspectives on different forms of narratives as data, and 'constructivist' is one of five main approaches which are identified by Decortis. This approach enabled me to draw on the social 'orientation' in narrative analysis identified by Bamberg (1997), as opposed to the individual orientation

(using narrative as a form of understanding an individual's processes of meaning-making within cognitive development). My 'orientation' towards narrative data is to treat it as part of social engagement between the individual and their world, that is within "the social matrix against which the particular experience is understandable and makes sense is what gives meaning to texts, to accounts of an experience, to the experience itself, and ultimately to the person who is telling it" (ibid., p. 90). A constructivist approach treats narrative as including a broad range of types, each of which appears within the interview transcripts:

Third-person and first-person narratives are given equal weight. Explanatory accounts are defined as narratives "as long as generalised actors (one, you, they) act and position themselves in their actions vis-à-vis others..." (Decortis, 2004, p. 7, citing Bamberg).

The narratives are therefore identified as accounts of any of these types which form a meaningful whole, by which the teachers create a projection of their experience, either by recounting an episode or telling a view of CMC and TPL from a perspective which includes or implies other social actors. Thus some are lengthy episodes of a learning experience, while others may be single sentences which encapsulate a meaningful distillation of a view or perception which the teacher offers to make it understandable within the interview.

6.2.3 Narrative analysis

Whilst reading the transcripts I was mindful of the fact that there are two levels of 'recontextualisation' (Brown and Dowling, 1998) which contribute to analysis here. The teachers have recontextualised their experiences by narrating them, and thus introduced a coherence by imposing a framework involving the foregrounding of some items to 'make sense' of their experiences. Thus the interview transcripts are already different from the actual processes in which they engaged. Then I engaged at a further stage away from the actual phenomenon of teachers' learning in CMC, by bringing my interpretation to their narratives as textual transcripts.

Importantly, Bamberg emphasises that a social orientation in approaching narrative analysis is based on a view of learning that is about understanding the experiences and the self,

rather than knowledge and information. Such learning takes place within cultural practices, rather than within the mind. Within this constructivist approach, I aim to make sense of the interviews as narrative data. The narratives are constituted by a range of cultural contexts which inform how the teachers talk about their experiences – the group culture, and the discourses of teaching, learning and professionalism on which they draw, as well as the research context itself. ‘I-as-researcher’ (Schostak, 2002, p. 10), am also constituted by these contexts. This requires an awareness of both my own and the teachers’ interpretations as taking place within cultural contexts. From the viewpoint of textual hermeneutics, Eagleton (2003) has considered the argument that such an awareness is difficult to achieve:

Since our culture is what we are made out of, it would mean that we would have to leap out of our skins, see ourselves seeing something, reflect on the very forces which make us human subjects in the first place (2003, p. 55).

The interviews were, of course, trying to see the teachers ‘seeing something’, and the paradoxes of this aim, and of my ‘seeing’ them do so, are made explicit. The interviews in one way were trying to achieve the impossible – of the teachers’ knowing themselves and the situation they were in, of ‘leaping out of their skins’. The responses which are analysed in this chapter suggest that there are challenges in being self-knowing, and it seems an unreasonable expectation to make of the teachers that they will be critically aware of their own cultural making in the context of learning with CMC. In interpreting the interviews, I too cannot ‘leap out of my cultural skin’. I too am contextualised by the social context. My original expectations in the design of the interviews, that I could elicit self-aware critique from the teachers, were modified by the process of interpretation. Whilst the online writing in Chapter 5 could be argued to be ‘an instance of itself’ i.e. it shows what the teachers actually wrote, the interview transcripts do not show what the teachers actually experienced. The experiences themselves had passed into their history of engagement in a culture, and so were remembered and articulated from a stance that had already been changed and affected by experience. Within the transcripts however, there is evidence of the teachers seeing themselves ‘seeing something’ which reflects the complexity of the practice they are part of. The recordings contain some long pauses in their responses (eighteen seconds at the longest) which suggest a resistance to instinctive and impulsive

answers and reflection upon the process of re-presenting the practice of CMC within their narratives. There are several examples of the teachers thinking outside of themselves and recognising the difficulties of interpreting within cultural contexts, for example “I know there’s not necessarily a right or wrong answer, but I suppose we do work in a culture of things being right or wrong, and you’ve kind of got that built within us...” (P8) and “that’s an interesting one isn’t it...it’s difficult to say what learning was going on for other people...I’m not really sure what I learnt, I don’t know how to explain that, I think the problem is I felt my role was different because of IT [she is a Head of Information Technology] and comfiness in there...so I think that’s really difficult for me to say what I learnt in there” (P5). This suggests that both the teachers and myself are able to situate our interpretations culturally, although the analysis will show that this is inconsistently achieved.

Eagleton (2003) argues that it *is* possible to interpret in such textual contexts, because “...reflecting critically on our situation is part of our situation. It is a feature of the peculiar way we belong to the world...You do not have to be standing in metaphysical outer-space” (pp. 60-62). He argues that all social and human phenomena is open to interpretation, and there is no value in seeking an ‘extra-cultural’ explanation because it would not be valid anyway. Throughout the case development, ‘staying close to the data’ has been a central interpretive principle, and here this involved my role as researcher in constituting what meanings could be made from the interviews, within the cultural contexts of their making.

My attempt to see the teachers ‘seeing something’ involved extensive re-reading of the transcripts, making notes and identifying patterns by highlighting the text. My attempt to use the interview schedule to organise their experiences into coherent themes was not appropriate to what they wanted to say. The prevalent and significant patterns which emerged were not around the six question categories I designed. I interpreted stronger thematic patterns across each interview and between interviews as a whole. The semi-structured nature of the interviews allowed the teachers to expand on some questions, while saying less on others, and I allowed this to happen to elicit the fullest narratives that were meaningful from their perspective and their ways of constructing what happened in the

online discussions. Although they all answered all the questions, my analysis of the transcripts showed that the question categories I devised to explore their engagement with CMC could not anticipate the significant patterns which in fact emerged from the teachers' efforts to render their experiences meaningful. The responses reflect that the teachers could not articulate their learning according to analytical categories which I had thought important. Instead, they narrated according to their perceptions and accounts which form the 'realities' which they constructed, and which I interpreted as being present in the data. I allowed the themes in what they narrated to emerge, since the interview format is intended to explore their perceptions and realities, and mine shifted in response to this. I thus discovered what Eagleton (2003) means by 'creativity' and 'a certain roughness' in textual interpretation of this sort:

To be exact, interpretation must be creative. It must draw upon tacit understandings of how life and language work, practical know-how which can never be precisely formulated...if we want to be as clear as possible, a certain roughness is unavoidable (p. 206).

Thus I will tell the 'story' of their TPL within CMC according to the themes which emerged, rather than organised by my pre-set categories of questions. This is my 'recontextualising' of their narratives within my own. By this I shape and give coherence to their interpretations. I am imposing a coherence upon their learning in ways they do not necessarily do themselves, but it is derived from their ways of organising the experiences. Luckin et al. (2001) argue that e-learning experiences are frequently fragmentary, and that tutors often impose a coherence on their perceptions of what goes on, which does not mirror the actual student engagement with technology enhanced learning practices. I am mindful of this when creating a narrative of teachers' engagement with CMC. The narrative I make creates a coherence, but it is a construct. It is a creative act, and is a possible explanation of what happens with TPL in CMC, just as the teachers' narratives of this are other explanations.

6.3 THE DATA

6.3.1 Data collection

The selection of the sample for semi-structured interviews was explained in the methodology chapter (3.4.1) and in relation to mapping the responses from participants in Chapter 4 (see Table 4.5). Eight interviews were conducted, which form 50% of the group. Following the pilot interview (see 3.4.2), each teacher was interviewed for approximately thirty minutes using the revised interview schedule (see Appendix II), and the interviews were recorded and transcribed. Thirty minutes was consistently sufficient to engage with all the interview questions. Three of the teachers were interviewed during the working day in their schools, in their empty classroom or a quiet staff work area, and rigid timeframes demanded that we kept to the allocated times. The remaining interviews took place at their request in my office, on days when they were visiting the building or a nearby location, and were timed to be consistent with the school-based interviews. The different locations for the interviews was due to meeting the needs of the teachers, who were all extremely busy, and I allowed them to suggest where they wanted the interview to happen for their convenience. By this I wanted them to feel a control over the experience, and to enable them to talk as candidly as possible. For some this meant meeting outside school, while for others a school visit from me suited their busy schedules. For a detailed account of the development of the interview questions and interview approach, see the methodology chapter (3.4 and 3.4.2). The interviews were semi-structured and allowed for points to be pursued and clarified within the time available by maintaining a fairly fast pace, although the teachers took time to reflect as they wished.

6.3.2 The interpretive process

The eight interview transcripts were read through together twice to establish their core features, and I made notes on the text as I read. I did not read individual transcripts repeatedly, as the case is not built around the teachers as individuals. Their perspectives are important to express a sense of what CMC involved for the group as a learning practice. Each reading of the set of transcripts involved a closer involvement in the key themes which emerged. I did not give equal attention to all the interview responses. I did not

highlight narratives within the interviews that did not refer to the practice of CMC, for example comments about personal events in schools, general views on being professional, learning how to use information technology or being recruited to the course. Having read the transcripts twice, three areas emerged which formed a core of common narratives related to TPL and CMC. I identified these as narratives of peer relations; narratives of textual relations and narratives of relations of reification.

These ‘relations’ best described the ways the narratives were connected to the other facets of the online discussion. The relations establish how the teachers are practising as individuals in connection with texts and peers within the conditions of the online discussions. In this way they are essential to context-making, which emerged in Chapter 5 as a core element of ‘social bonds’ in a theory of TPL in CMC which I developed from QCA. In this theory, derived from textual analysis of their online messages, I argued that “The participants share explicitly the ways in which they are learning as part of the group, and so establish a culture of participation and of how this particular group will ‘be’” (5.4.4.2). Social bonds are in fact part of multiple forms of relations which connect the teachers in the case as learning participants. Sets of relations, as manifested in the interviews, and are a way of perceiving the multiple interactions which constitute their engagement with CMC and TPL. Re-reading helped me establish that there are three sets of relations which underpinned the variety of ways they narrated their experiences:

Peer relations

Narratives of peer relations focused on concepts and experiences of community, feeling safe, and mutuality. The teachers narrate the ways they feel connected to their peers through CMC. These relations show in their perceptions of there being a community online and how they perceive themselves in relation to others, in terms of relationships which affect their learning. A range of factors affect the peer relations, based on feeling secure and having mutual interests and commitments on which to base collaborative practice.

Textual relations

Narratives of textual relations focused on concepts and experiences of the online text as an extension of the self, and of learning through other participants' online texts. These are the ways in which individuals are connected with the online writing within the group. These relations show in the narration of their engagement with reading and writing online texts, and are based on how they perceive the texts as learning tools. This means how they make sense of others' texts, and how they perceive the need to make their own texts make sense for others. Textual relations are part of how the teachers view themselves as authors in relation to an audience of readers, and as readers of others. There is a strong connection with social relations, but the focus in these relations is on the ways the teachers have a sense of their 'being' within texts.

Relations of reification

These narratives tell of the social rendering of meaning, and how the teachers perceive their ideas are affected by shared thinking processes. These relations are about how the teachers think with and through others about the meaning of professional phenomena. This is often narrated explicitly, and the narratives of these relations are in fact meta-narratives of the teachers' learning, which involve the teachers in further learning through the process of constructing the narratives.

Having identified these sets of relations within the transcripts, I read through the transcripts again and highlighted the text to distinguish where these three sets of relations underpinned the narratives. I then re-read the highlighted material to see if it formed a coherent representation of the relations I identified. I did not read the transcripts 'naïvely' as I had already explored evidence of social and cognitive presence in the online texts through QCA, and was aware of key issues which had emerged as latent variables of TPL within CMC in that analysis: social bonds, ways of talking, meaning-making in a COP, and learning and identity (see 5.4.5). I did not look for these in the interview transcripts, but interpretation within a case takes place within an ongoing and developing understanding of

the research topic. It is a process of making informed refinements of meaning, based on familiarity with the accumulating perspectives which each part brings.

6.4 ANALYSIS

6.4.1 Peer relations

Community

The interview questions about community elicited considerable insights into peer relations. There were very different accounts of being part of a community. The presence of a supportive ‘network’ was a strong memory for some:

It was that little support network that we built up...we felt that we were supporting each other by responding to each other’s postings. (P8)

Getting to know people as individuals, in terms of what they think, was central to memories of feeling part of a community, which was interpreted as a positive experience by P3:

I really enjoyed that...checking [postings from peers] to see, reading other people’s as well, I found that really interesting, not only from the point of view of what they’d written, but also matching people to what they’d written as well [laughter], a bit nosey, almost like ‘oh, so that’s what that person thinks’.

Other interpretations were less positive. For P2 there was little sense of being in a community, “because we don’t really communicate that much”. This contrasts starkly with P8’s interpretation, for whom “we were a group and we were all working to the same end, and we had that common link, we were a little team”, though he distinguishes being a ‘group’ rather than a ‘community’ saying that a community means ‘living together’. P5 also distinguished the teachers as a ‘group’ rather than a community. She offered an interpretation of this judgement, saying ‘I don’t think it was quite cohesive enough’, suggesting that there were ‘key players’ rather than equal engagement among members,

and for this reason she could not call it a community. P6 makes an outright rejection of the concept of there being a community:

As far as online mythical community, it's er, in cyberspace, I don't really buy in to that...I don't feel that I belong to such, it's simply just the medium to expresss yourself.

It seems that individual expression is more important for this participant than collaborative involvement. He interprets CMC as a technological facilitation rather than a practice, valuing it for giving "access to people having their chance to have their say". He goes on to expand on some of the possible barriers he perceives to making productive relationships with peers:

I think they probably think that I'm arrogant, that I'm over-confident...I think I've been criticised for not attending all the sessions.

This is an example of a multi-layered narrative. It involves the teacher's interpretation of his peers' interpretation of him, which I then interpret. Representations of self form part of complex peer relations, by which these individuals interpret how they are connected to their fellow teachers by the practice of CMC. Peer relations involve processes of self-disclosure, and here they come together like looking through mirrors within mirrors of what is happening within the social context of CMC. It is impossible to tell if his peers *do* think he is 'arrogant', whether this affects participation for any or all of them, what impact this has on TPL, and how far he is establishing this as an unjustified interpretation of him as a participant. The 'truth' of any of this is in fact immaterial in narrative interpretation. What can be interpreted in the narrative is that representations of self are part of the learning dynamic of the community, which is steered by the participants. Blake (2000, p. 194) comments on the increased power over self-disclosure in relation to online contexts, by which he means the way in which the student can influence, if not control, "the ways in which her tutor 'sees' her as a person beyond a purely academic ego". For these teachers, this desire to influence how they are 'seen' is suggested by the interview responses, but pertains mostly significantly to their fellow teachers within the online context. Certainly, the intention to control the representation of an 'ego' emerges as a factor in online peer

relations, and impacts upon the collaborative learning conditions within the electronic forum. Further to this, the wish to create a narrative of the self in the interview builds in another layer of representation. The relations between individual learners and their peers are in part dependent upon degrees of safety and risk-taking in presenting the 'self' online, which informs several of the teachers' narratives:

I can say a little more than I would if I wasn't looking somebody in the eye, I can get away with doing it, and I can be a little bit more, not so much me, and develop another character if I want to. (P5)

because it's not face-to-face, when you respond to what somebody says it does become more difficult in how you word it, because...you've got...you know, people you don't necessarily know, you might have read something out of context, again you might want to offend someone...it depends doesn't it? (P8)

I tended to try to make my postings...so they were sometimes maybe a little bit harsh, or reactionary. Well, not reactionary, but maybe a little bit, just, just playing devil's advocate really. (P6)

You don't want to be the one that replies to everybody else [laughter]...I sometimes felt 'oh no, I don't want to say that' because I would have liked to come back and say a couple of one-liners to people, and then thought, oh no, I don't want to say that because I don't know how they'll take it, or how it will be interpreted. (P3)

In Blake's (2000) view, this ability to project an 'ego' online affects learning where learning is understood as personal transformation with the learner emerging not only as a 'better informed' or 'more skilful' person, but also as a 'different' person. Increased power over self-disclosure adds emphasis to treating the textual material from the online discussions as an 'instance of something else', and the impossibility of conflating what gets written with the author's actual thinking. These insights into peer relations suggest the impossibility of adopting a psycho-analytical approach to understanding texts as revealing the author's actual beliefs. They reflect back to the QCA process as one which analyses texts as cultural and social artefacts, made in relation with other 'egos', and open to hermeneutical reasoning in order to derive meanings which are determined by the reader.

Feeling safe

The teachers have different and contradictory experiences of CMC which affect how safe they feel with peer collaboration. For one participant, 'the community actually seemed quite large' (P14) whereas for another,

You felt you could be open and also it was quite safe...it's not too big, our tutor group wasn't too big, it was quite a nice size, there was enough of you to have a good discussion, but not too many that you kind of felt lost within it. (P9)

'Feeling safe' was a recurrent theme within peer relations which affect TPL in CMC. P9 expands her views on what she calls the 'key things':

...there needs to be the feeling of openness...you need to feel, seems silly but you need to feel safe, so when you're sending out these postings, you need to feel that everyone is open to everyone else's opinions, and you *found* that after the first one, you'd put your opinion up and you found that others would agree with you or disagree with you, but you felt safe enough to put your opinion out there...

For some, like P9, the collaborative practice is 'safe', and for P5 'it's quite safe'. For most, however, there remain unresolved conflicts in terms of feelings of vulnerability and taking self-responsibility for learning and engagement in the learning of peers. This makes online interaction 'being laid bare' for P8, while for P9 it is 'opening yourself up':

You are very much on your own, and you...felt like you were being laid bare, because what you put down for people to read, you weren't going to be able to back it up straight away. (P8)

...you are kind of opening yourself up to putting your posting within your group...you felt safe enough to put your opinion out there and you also felt that no one would put you down or anything for what you felt according to the task. (P9)

Feeling safe was important for being able to participate, and this took longer for some people to achieve: "it's a bit nerve-wracking" (P11). These features of peer relations reflect

well-established arguments for the importance of establishing social bonds to enable learning within CMC (for example, Salmon, 2000; Rovai, 2002; Jones, 2002). In chapter 5, I established that social bonds and cognitive bonds are intrinsically connected with each other, and are interdependent in the formation of 'thinking participants'. Individual differences between teachers in feeling safe suggest that the inseparability of social and cognitive bonds means that for some, the learning experience is inhibited by feelings of social anxiety.

Thus it is impossible to interpret the collaborative practice of CMC as having universal affective features for TPL. Peer relationships are extremely important, but determined by individual differences in perspective. Each teacher's account may be their 'truth' and experience of a 'reality' of CMC, but this reality is a construction of theirs. The teachers are aware that their learning could be constrained by uneasy relationships within the group. They refer knowingly to opportunities for misunderstanding, misrepresenting, understating, overstating and causing (unintentional and intentional) offence, and that misunderstandings take effort to be put right:

I did get a reply and wasn't particularly enamoured with it, because it misread...what I said, and I think that's the only problem...assumptions will be made and things read into what you're writing...but there's no easy way to get round that. (P6)

...you might have read something out of context. (P8)

...you haven't got the nods and the body language and the facial expression. (P5)

The narratives indicate that the teachers' learning within the online discussions is highly personal and individual differences in interpretation of the same phenomena are significant. Not only do the teachers tell different stories of the same situation, they interpret the same stories differently. So one person's 'large group' is another person's not large group. Such differences affect the ways a person wishes to be seen and the ways they are seen as a participant, and affect engagement with collaborative learning practices.

Mutuality

Feelings of mutual engagement through online discussion were based on the perception of other teachers being highly motivated and professional, of being “people who are all prepared to do the same sort of things...to interact with other members of the community” (P14). There were differing narratives of mutuality, again revealing widely differing interpretations of the degree of shared concerns and interests in the group. P14 felt there was a ‘major division’ between the interests of primary and secondary school teachers, a view shared by P2, “outside the scope of the masters and the online discussions I don’t think we’ve really got anything else to discuss”, whereas P5 articulates a paradoxical perspective “the primary teachers had the same problems as us, but very different” and P11 said “it was absolutely fascinating finding out the same sort of problems at A level and nursery”. Regardless of this range of ways of constructing the differences within the group, all the teachers said at some point that there was a significant basis of mutual knowledge and understanding on which to base a discussion from which they could learn, for example, “There were a lot of people with similar experiences and thoughts and beliefs as myself”. (P14)

There is evidence of the teachers being able to ‘see themselves’ as narrators within shared cultural contexts which determine their ‘stories’. P5 refers explicitly to the shared stock of narratives which the participants have in common on which they draw in their online discussions:

There are lots of stories to tell, and we’ve all got the same ones dressed up in different words and different scenarios.

As well as this sense of mutuality however, P6 and P5 raise the need for contention as an important ingredient of learning in online discussion. P5 describes the need she perceives for people to respond more to ‘provocative things’ and P6 suggests:

If you get someone else in the group who is quite Bolshy, it makes things quite interesting and that is what you want, is an engaging learning debate.

This kind of perception is bound up with the complexity of online peer relations. Trust in the mutual concerns of the group is important here:

You've got to be able to be in the position where you don't mind somebody disagreeing with your point of view...be prepared that somebody might take issue...nobody was trying to knock anybody down...people could be quite open and quite sort of frank without causing offence. (P14)

Such an interpretation of peer relations is subtle, and refers to the idea of 'the position' participants achieve in being able to participate effectively. Being 'positioned' emerges in my interpretation as a helpful way of viewing peer relations, and in fact of viewing all the sets of relations in the teachers' narratives. Being 'positioned' in relation to fellow participants is also connected with being positioned in relation to the texts which are written with, by, and for them, and positioned in relation to the meaning-making which occurs through interdependent ideas.

6.4.2 Textual relations

The self and the text

The textuality of the online discussions is the second core aspect of relations within CMC which impact on learning. The teachers tell about their experiences as readers and writers of online texts with which they learn. Their narratives contain many examples of the need for the online texts to operate as a thinking tool, but also the difficulties of viewing online writing as a learning process. Within the complex social and literate practice of CMC, writing online with peers is risky because, for some participants, what they 'put out there' makes them vulnerable:

...every word you put down you are thinking really carefully about, like 'Oh God, what if that's not right' or... that was difficult, because it really was like writing an essay each time, it wasn't like having a chat, like you were in a seminar, and I know some people

would write ‘what do you make of this?’ but I was much like, it was like doing an essay, it really was, but again that is the way that I operate. (P8)

Such a narrative of remembered anxiety and the way the writing process is interpreted (‘that is the way I operate’) is representative of the way that the teachers thought of their texts as extensions of themselves. The importance of appearing competent whilst engaging with other teachers at masters level is a feature which affected the way they wrote online, according to P8’s presentation and interpretation of his narrative. He dramatises the anxiety by reporting his own direct speech, ‘Oh God…’, and establishes himself as the central ego in his own story – that is the way *he is*. This conflation of the writing with the person is also conveyed in a reflective narrative by P5. Having her views acknowledged within the discussion was “very important, very important, we are all human and we all like to be acknowledged”. Online exchange in the MTeach discussions does not form part of the assessed coursework, and participants are advised to see it as an *informal* and exploratory mode of communication, with an emphasis on *participation*. Despite this, in the narratives, several teachers explained how much they invest in their ‘performance’ as writers online, and their reluctance to accept the participatory priorities emphasised by the course philosophy. They relive the anxieties and relief of participating, and relay the thoughts they had:

You had expectations that whatever writing you did for the MA would need to be of a certain quality, so it was only after the first online discussion I think you realised when you looked at everyone else’s writing that it didn’t have to be, even though we were *told*, erm, I do remember being told, ooh you know, it is quite informal and it’s obviously only within your tutor group but I think you think, well it’s there, it’s online, your tutor could print it off and it could be counted towards, you know… I was a bit concerned that it would have to be a certain quality, but actually the more discussions we did, you realised, especially your response, it could be really brief and it could be just a question back to somebody, so yeah I’d say it was really only the first discussion that I thought oh, does my writing need to be this standard… (P9)

…you presented your point of view so that’s the polished, final version that you put out. I mean I didn’t tend to just jot down all my initial thoughts and then put them straight on. (P11)

It meant that getting responses to what has been written is perceived as crucial:

It was very important really...if people hadn't responded to me, I might think, ooh, they wouldn't think it was good enough to bother responding...if you hadn't studied for a while, you're quite concerned about the quality of your writing. (P9)

When people either referred to stuff that I'd written or tailored a response directly to me, I thought that was quite encouraging. (P2)

If you didn't get [a response] you felt like what you had written was probably a load of rubbish...when you're working on your own you're not necessarily sure that what you're saying is the right answer, I know there's not necessarily a right or wrong answer, but we work in a culture of things being right and wrong, and you've kind of got that built within us, and if somebody didn't respond to you then you go like 'Oh no, I don't think what I've written is very good'. (P8)

These narratives contextualise the human dimensions behind the maps I constructed in Chapter 4. At that point, it became clear that on some occasions a teacher's task received no responses, and that their text was a 'null point' on the map. Such a text would, according to P8, make the author feel that they had written 'a load of rubbish'. The fact that Chapter 4 showed very few null points, no consistently 'null' authors, and a high degree of 'inclusiveness' (see section 4.2.8) gains further significance in the light of the teachers' narratives. Textual relations were viewed in Chapter 4 through the sociometric lens of 'relatedness'. In this chapter, the mapping data is recontextualised. The significance of 'relatedness' applies differently. 'Relatedness' as a theoretical term in Chapter 4 means the way of understanding patterns of connections between social phenomena, in this case between online texts. In this chapter, the significance of the term becomes amplified, by considering what is at stake for the participants in the ways their texts are connected, and how the state of connection with other texts has an impact on the learning of the participants, affecting their view of themselves as valid participants and valid thinkers. Relatedness is not just about connections between cognitive content in texts. It affects the relations between people brought about by texts, because it affects their views of ideas being more or less valuable, and likewise of themselves being more or less valuable as participants in learning.

The process of interacting with online texts as tools for thinking was narrated by several participants. P3 and P8 offer extensive narrative insights into their ways of learning through interacting with online texts, along with others which are not so expansive:

The ones that I could understand and see a point to from my point of view, I was obviously interested in them, and that's how I chose to respond to them, some of them I read, and read and read, and you still couldn't see where they were coming from...for me it was better than face to face discussions because it gave you a chance to think about it in more detail...I did spend some time obviously planning my response and reading and thinking a lot about it...so I thought it was probably quite formal, you know, putting comments on...to me learning is finding out something new...so every time I read a posting or took part in a discussion, to me that was a learning experience...I also got to know the people's postings that I could relate to and learn from...you know what you know, you don't know what you don't know, so as soon as you read someone else's, it's learning because you think right, there's something else for me to consider. (P3)

You'd read somebody else's response and then you'd read...what [another] person has written and you think, yeah, that's good, or you might have a completely opposing view, in which case I'd write about that as well, and I'd say 'I don't agree with what so-and-so said' and so I can see both sides of the coin...by reading what somebody else has put you are able to maybe understand more clearly. (P8)

Various people in their online postings would discuss particular reading sources and then explain what they meant, which [on] the first reflection I may not have got to grips with so I think that was quite useful. (P2)

If someone just retells their understanding of something that they've read, that I don't think is necessarily going to be much use. (P6)

The close descriptions and explanations of practice which are narratives here, point to the role of online texts in learning. The asynchronous online environment is central to enabling participants to re-read over time, and return to what others have written. Having *time* to read and write online texts emerges as central in textual relations for the majority:

You had to think about it in a particular timescale and you had to read the stuff and do it... (P11)

It does give everyone a chance to respond, give people time to think about what they want, and compose it, to erm, continually refine what they want to write...it makes you much more self-critical, what you're writing. (P6)

Development over time of being able to discuss research (is a benefit of online discussion). (P14)

This feature of thinking over time can be perceived as important in all the teachers' narratives of explanation, except for those by P6. P6 projects online writing as a personal activity to express his views, and the asynchronous environment does not affect what is important for him, as he does not see it as important to interact with others' views. Writing is perceived as more of a 'broadcasting' activity within a transmission-oriented learning practice:

If you engage in these questions anyway, you should be able to just put over your own personal opinions in a fairly matter of fact way.

P6 is a reminder that not all the teachers can be said to be willing participants in the 'social and cognitive construction of meaning' which Lapadat (2002) argues to be the effect of asynchronous textual interaction. Nonetheless, other participants referred to the contributions from this teacher as being provocative of their thinking, and the textual analysis in Chapter 5 found that teachers revised their thinking after reading his contributions (see messages 3Mf#1 and 3Mf#2 included in the coding table in Appendix V). His belief that CMC is purely for 'putting over your personal opinions' has not prevented responses to his messages appearing as manifest variables for meta-level engagement for the indicator 'reconsidering views', which is an activity important to the social construction of knowledge. Considering the group as a learning community in the form of a COP focuses on the *effects* of learning together as practices, rather than learner *intentions*. This seems important in understanding why features of a COP can be interpreted as being present, even when the teachers cannot agree on what a community is, and disassociate acts of community from being *in* a community. The participants' interpretations of learning are just that. They contribute to an understanding of the phenomenon, but cannot tell us if it exists or not. Their narratives suggest that textual relations of learning exist, but their nature is for the researcher to interpret.

6.4.3 Relations of reification

This third set of relations underpins how meanings relevant to TPL are made from social and literate interaction. They help explain how teachers engage with conceptual work, involving transformations in understanding which have a future perspective and are practice-focused – these are the ways TPL has been defined in Chapter 2, (2.1). The majority of the narratives tell of online discussion as an interdependent practice, by which participants render professional phenomena meaningful. These relations were communicated in some of the longest, sustained interview narratives from the teachers. They are cohesive across the interview process, and there were few questions from me to interrupt the narrative flow, so that a continuous account formed. The process they experienced, of negotiating meaning through CMC, is made explicit in these meta-narratives, and supports Eagleton's (2003) claim that we can look at our culture with understanding *and* be part of it – it is being part of it which makes it possible to understand, and *is* part of it. The narratives of personal engagement with CMC and the group learning are in fact meta-narratives of their own learning. The narrative below is a lengthy example from P9. As a learner narrative, it can be interpreted as carrying out the first of Cortazzi's (2001) narrative functions in research – enabling the learner to continue learning by organising the experience of it. It forms a continuation of her own learning process as a 'form-giving' process in itself. Thus, layers of narrative are again brought together in the interviews. She both narrates events – the story of how she interacted with peers to render things meaningful – and constructs a narrative of her own involvement in processes of reification in relation to others involved in those processes:

the learning that was going on was personal learning to begin with...because you were given the task and you had to respond to that task yourself, so you had your own reading to do, you had various options often on the task, you had to kind of think about what interested you, thought about what would interest you or be of use to you, to find out about that, then you'd do your readings, so it was personal and independent learning to begin with, and then it widened up to the online discussion where you would then be learning through others because they would have their postings...online so you would learn more because you'd put what you thought and then someone else might think differently and that would then make you think, so it

was ongoing, it was obviously interactive because you were able to respond and then have someone respond back and that would go on as long as you wanted it to, but I think it starts off on your own individual, and then it really opens up to the whole discussion, where you'd be learning through...the other members of your tutor group – as well...you're learning on your own, you're doing the task yourself and you're thinking 'well I think this, I think that', but then when everyone else puts their postings on, they come at things from a different angle, and you think 'oh, I didn't think that', they might have done one other aspect, one other of the tasks that you hadn't done, so you'd be learning through that as well. (P9)

Her meta-narrative is her exploration of her learning. To do this, her narrative of events of participation is punctuated with reflective commentary, in which she interprets the events for the listener, for example "so it was personal and independent learning to begin with, and then it widened up..." and "so it was ongoing...". She then clarifies the meaning of the events, which is an interpretive act which confirms and deepens her understanding as well as mine, "but I think it starts off on your own individual, and then it really opens up..." and re-presents her interpretation through 're-living' the events themselves, "you're doing the task yourself and you're thinking 'well I think this, I think that'...". This helps form a final summary of her narrative of experience, which has in fact been several micro-narratives in which the same experiences are revisited in different forms until she is satisfied that she has projected the experience as fully as possible. By this narrative process, she revisits the practice of her individual and shared engagements with ideas, and tells about changing her ideas in the light of other peoples'. She articulates the relationship between individual and collaborative learning as containing relations which process the rendering of meaning. In online contexts, the shifting locus of learning between the individual and the group is conspicuous and conditioned by the asynchronous environment. Her narrative suggests it becomes more discernible to those involved. This is an instance of a participant 'seeing herself' learning, and seeing herself more clearly. 'Seeing' like this involved sustained narration. P8 offers another example of a participant 'seeing' his own learning process:

It was like having a seminar over the internet...it's getting you to think from another person's perspective, and getting you to re-think perhaps something you believed to begin with, and when you see somebody else's point of view , you perhaps realise that you weren't necessarily right, or it was an issue you hadn't picked up on, that you needed to look at to re-address what your first reaction was...I raised more questions latterly than I did at the beginning because you learn

to think in a slightly different way, because in the beginning you go in there and you're all guns blazing and it's like 'this is what I think' and as the course goes on you realise there are actually lots and lots of different perspectives to look at something from and you realise that you know what you are saying each time, you might believe in it, but there's not necessarily a right and a wrong, and I know from reading other people's postings, sometimes those who were very, had very strong opinions, such as 'yeah, I think this research is a load of rubbish', this makes you realise that you can't actually be so strong in your opinions. (P8)

After a pause of eighteen seconds, P8 gave a further narrative account of how other people were learning in the online discussions. Here he tells the same story from a different narrative perspective. He is no longer the first person narrator in his own story for most of the time, but has generalised from his initial personal account to a reflection on reification processes within the group. The dramatisation of events in the first narrative, illustrated by metaphorical description "you go in there and you're all guns blazing" and reported direct 'inner speech', "it's like, 'this is what I think'", is replaced in the second by an extended explanation of what happened, now narrated in the third person:

People were putting their thoughts into words, and they were also reassessing their own ideas through the discussion with other people and seeing what other people's opinions were and how other people had read the papers, and responded to them, and used other people's experiences to influence what they thought, I suppose that was the most important learning going on. (P8)

There were also many shorter narratives which indicate that this awareness of meaning-making through interacting with others was central to learning, though not all the teachers created such sustained accounts. They include narratives based on recalling meaning-making experiences, all of them rooted in interacting with others' ideas:

If I strongly agreed with something I might back that up, and if I strongly disagreed with something I would, so it was really emotional, intellectual response whether I thought somebody was wrong or right. (P11)

Sometimes other members of the community were able to say something which kind of brought home perhaps something which I had not grasped initially in the reading. (P14)

As I grew in confidence through the course I'd respond to somebody that had come up with a completely different point of view from my own, so you have a decent argument. (P2)

They also offer reflective accounts of meaning-making, in one case pointing out that, ironically, there is too much talking in face-to-face sessions to learn adequately:

...the point [of online discussion] I thought was to just get a bunch of sort of reflective people together to start sharing and start understanding some of the more complex issues to do with all the things we were learning about at the time, just take it all a stage further...widen it out, and start engaging in discussion, because we can't all meet face-to-face, because when we do we can't stop talking... (P5).

it was another way of learning, I suppose the significant difference was it was more of an *informed* discussion, so you read all the information, your contributions weren't so much gut reaction, kind of considered (P11).

I think it's to clarify your understanding and to um, improve your learning really, and learning from each other...you learn a lot from other people (P11)

It did give people a chance to, people just say one sentence, and you think, you can go somewhere else with it (P3)

The narratives were of the process of making meanings within CMC. There were very few examples of the teachers narrating specific topics related to practice which they had learnt about, but P6 sums these up in a form of list:

Learning from other people what they perceive to be appropriate professional behaviour and standards and what other people do, how they respond and the lessons that they've taught, and how they deal with kids, and their different individual scenarios.

P2 also tries to 'concretise' the learning by describing specific practice-related change which it made possible:

I think the content of the online discussions and the sorts of ideas that we've discussed, um, have been fed back into my own practice, so if you think about a professional teacher, it would be one that reflects on their own practice and actively thinks about how that can be amended and improved in the future for the benefit of

their colleagues and the students, then I think the online discussions have certainly helped me to do that (P2).

None of these attempts to itemise content-based knowledge outcomes from the discussions were very clear. Mostly, the teachers do not attempt to describe learning in terms of concrete conceptual or subject-based items of knowledge. In fact, they find this difficult:

I haven't thought about this [what I learnt] before, it's funny that I should find that difficult to answer, because I'm not sure, I'm really not sure and I wouldn't want to make it sound like I've come away with nothing because that's not true.

When asked to tell about what they learnt, the majority chose to tell about making sense of their engagement with CMC. This prompts considerable reflection for some individuals, involving sustained efforts to articulate experience and explain it. This is done with varying degrees of detail and insight, and this may be because I was asking the teachers to 'leap out of their skins'. It was a challenge to articulate what Andriessen et al. (2003) have called the 'uncertain process' of learning about knowledge-making processes, which CMC appears to encourage. It requires a capacity to examine the self within the socio-cultural practices which constitute it.

6.5 ANALYSIS AND SYNTHESIS OF THE CASE

The interviews have brought a complication to the analysis of CMC as impacting on TPL. Community and agency have been identified throughout the case as core to identifying the impact of CMC on TPL. Chapter 5 identified evidence of collaborative learning in the content of online texts, and argued that the texts showed evidence of a community being present which has features in common with a COP. The teacher narratives in this chapter endorse these findings, in that collaborative learning and 'joint thinking' are strong features within all three sets of relations which I interpret as being present, and the accounts confirm the core elements of a COP are present. The twin processes of participation and reification can be identified in the teachers' narratives, both in their consciously constructed narratives of remembered episodes of engaging with CMC, and in their reflections in which they create meaningful commentaries involving thinking out loud about the interdependent

processes they have been part of. But the teachers resist the term ‘community’ to describe their learning practices, and this requires further examination.

These narratives suggest that learning *within* practice is a feature of their engagement with CMC. At the same time, they resist making a connection between these narratives of their joint thinking and a concept of community. The narratives have this central, internal contradiction. They point to the practice of a COP in which learning happens through processes of participation and reification, but there is resistance to the concept of community to describe these experiences. Many of the teachers value face-to-face experience as part of the formation of their online learning relations. All the teachers interviewed report the need for face-to-face contact. They articulate the complexity of the relationship between face-to-face contact with peers and CMC, and how this is bound up with the social dynamic of peer relations within the group. The narratives include memories of the face to face teaching days and how important they were for developing positive peer relations online, and suggest that continuing involvement of students with face-to-face tuition is an important part of the development of online learning relationships for this group of teachers:

We did quite enjoy the Saturdays once we were there, because we knew we went out for lunch...and we were having a chat...it was that security thing, talking about the course and what you are thinking and what you've done in terms of your work...so it's like that security blanket. (P8)

Having met them in the flesh as well, I mean that helped, enormously...because we met quite regularly over the first year, then it was quite a community...Because it makes you feel not at a distance from the whole process. (P14)

They call themselves a ‘group’ or a ‘team’ or a ‘bunch of sort of reflexive people’ but only P9 calls it a ‘community’, and P14 ‘quite a community’. This may be because they cannot ‘leap out of their cultural skins’, or may be because the tensions they narrate prevent them conceiving of the group as a community, despite describing their learning so explicitly in terms of the effects of interaction within a group bound by common purposes. This points to the complexity of the relations which constitute TPL. They associate ‘community’ with physical proximity, referring to ‘living together’ and going ‘out for lunch’ as features of

communities. To this extent, it is possible that perhaps they cannot see outside of their previous cultural expectations of what a community is, and expectations and perceptions of a community do not match an online practice for them at this stage.

Agency is the other significant element identified in Chapter 2 as a feature of TPL within CMC (2.3.3.5). Textual analysis in Chapter 5 concluded by making some reservations about agency being present within the online discussions. There was a tension between the teachers' readiness to engage with counter-narratives and critical thinking, and the effects of hegemony. The teachers sought to occupy authorised discourses of teaching which conferred on them competent identities, and showed them as operating effectively within the current educational 'economy of satisfaction' (Standish, 2007). The interview narratives include several agentive features, according to theoretical perspectives of TPL. This is in their articulation of meta-learning, and in how they allow the teachers to be reflexively self-aware. They voice the ways that thought and action are contextualised by cultural constraints and individual perceptions, and they are aware to an extent of the contexts of their cultural making as teachers, and the need to portray themselves as competent according to these contexts. This self-awareness in itself is an agentive element within their learning, and underpins an ability, in many cases, to see themselves learning, and thus understand this process. In terms of CMC as a social and literate practice, they exercise control over disclosure and steer the textual representation of their teacher identities. Most importantly, they enter into processes of negotiation about what things mean, and for most of them, they seek to learn from their peers and come to trust in themselves as sources of mutual learning – or 'joint thinking'. They come to accept that ideas are provisional, and that knowledge is therefore not fixed and is contestable through collaborative practice. All of this points to the agentive dimensions of their TPL within CMC. At the same time however, one of them says that although he knows 'there is no right and wrong' the tendency towards complying with prevalent fixed notions of correct answers, (and thus correct knowledge) is 'built within us'. Agentive thinking and practice remains circumscribed by the wider socio-cultural context which encourages the co-option of teachers into complying with dominant performative and competent concepts of teaching and teachers' knowledge. There are agentive processes at work here however. Agency is best described here as an ongoing

process in which the teachers are constantly being repositioned in terms of what beliefs they can hold, and what it means to learn as a teacher. The sets of relations by which they construct their professional learning within CMC are all constantly shifting, as they negotiate their interdependent relationships with the elements of their learning – peers, texts, and reification processes.

Thus the interviews reflect how the online participants have a broad spectrum of understandings of ‘interaction’, ‘learning’ and ‘community’, and multiple and sometimes inconsistent views on how they are learning within CMC. The narratives support the assertion made by Andriessen et al. (2003, p. 2) that transition from individual, primarily content-based learning practices to collaborative, knowledge-making ones is an ‘uncertain process’. At this stage in the development of CMC, online participants are part of a very recent and constantly accelerating history of change in how learning can be organised and conceptualised. This shift in emphasis to the ‘knowledge age’ (as opposed to the transmission-oriented ‘information age’, Andriessen et al., 2003) denotes an altered perception of people as agents, who become ‘different’ people within learning practices, through sharing collaborative responsibility for making their knowledge through interdependent processes. This brings a conceptual shift in how participants see themselves as learners, and understand processes of joint thinking. There is evidence of such a shift, which involves agentive dimensions, but it is not consistent, and is experienced differently by individuals.

6.6 CONCLUSION

The social context of the interviews allowed for extensive pause and reflection by the teachers and by me on the human and social dimensions of CMC and TPL, and this was captured by the metaphor of ‘sets of relations’. The teachers found it hard to answer direct questions about their professional learning as a phenomenon of CMC, and out of all the questions, these were the most limited responses in length and conceptual complexity. Instead, they spoke about the ongoing negotiation of learning within the discussions, in terms of aspects which made them feel more or less secure, competent and knowledgeable

as learners. These aspects were formed from a complex of interactions between the teachers and the texts they wrote and read and how they perceived interaction with their peers as contributing to the learning process. It is these experiential accounts which inform the basis of the analysis, in the form of 'relations'.

Engagement with collaborative and interdependent learning practices is by no means familiar territory for the participants. The teachers offer multiple and contradictory accounts of learning within CMC. There are inconsistencies within narrative accounts and between narratives of the same thing. In terms of 'who they become' and 'how they learn', there is evidence that CMC can impact on teachers' identities as learners, by fostering engagement with reflexive processes in order to negotiate the meanings of their professional actions and the contexts within which they occur. Engaging in CMC can invoke a range of individual and interdependent practices, and each contributes to the professional reassessment of an issue or topic. These teachers' accounts of CMC indicate that multiple transformational processes take place, and that this practice can support teachers to better understand their learning, and that this is part of being a teacher. These processes can be articulated, but also resisted and distrusted. Resistance to the term 'community' does not mean there is not a community. The interpretation of the *processes* they describe suggest that there is one, in Wenger's terms of participation and reification which take place by talking within practice. But, ironically, for the teachers who are talking within practice, *community* is not a term that appears to be the subject of analysis or reflexivity itself within their experience as teachers. The practices involved are unsettling enough, and the naming of them as involving community would suggest they evolve into 'thingness' as professional phenomena – a COP would need to define itself by according this term to itself. It seems that most of the teachers are not at a stage where they can do this.

The teachers appear to occupy different stances within the sets of relations at different times, and this prevents a definitive identification of their learning as containing community and agentive perspectives. They become 'positioned' (P14). If knowledge making is a process understood as 'who we become' and 'how we learn' as opposed to 'what information we possess' (Andriessen et al., 2003), then it can be argued that CMC

has the capacity to impact on teachers' identities as learners who are constantly 'repositioning' themselves and being repositioned by the relations which constitute their learning within CMC. By playing out their 'selves' online in relation to textual authorship, teachers enter into negotiation around the meaning of professional phenomena, including their own learning. This is the source of agentive potential in the practice of CMC – the capacity to foster reflexivity and remake identities as learners within a collaborative practice.

6.7 SUMMARY

This chapter has presented the interviews with the teachers as narrative data. By constructing a narrative interpretation based on the teachers' narratives, I have interpreted the ways the teachers project their experiences of learning and practising within CMC and how these narratives develop their learning. There are inconsistencies within and between accounts of how CMC is experienced and conceived of, particularly as constituting a community. Rather than invalidating the data, I argue that these inconsistencies are part of the way the teachers are positioned by three sets of relations which constitute their professional learning within CMC. Relations between peers, texts, and reification processes are multifaceted, and the teachers are constantly repositioning themselves and being repositioned within these relations. I have shown that elements of community and agency are present in their learning within CMC, but both are discernible by interpretation of the effects of practising CMC, rather than consciously established by the desires or intentions of the learners. TPL is conditioned by external socio-cultural contexts as well as individual differences in how the teachers perceive the purposes of learning in collaborative contexts. The impact of CMC is on TPL as collaborative *processes* of meaning-making, which can be understood by those involved in them and constructed by them. It is this *process* focus of TPL which emerges from this stage of the case, and is identified as the 'professional phenomenon' about which transformed understandings are effected by CMC.

CHAPTER 7 SYNTHESIS AND CONCLUSION

7.1 INTRODUCTION

In this chapter I aim to bring together the perspectives adopted within the case and develop an overview of it, containing both analytical and reflective elements. I offer a reflection on the process of ‘critical borrowing’ and how it has involved a learning orientation towards the research. In the case approach, analysis has been developed through each stage of presenting the data. It is not the intention to repeat analysis already made in previous chapters, but to synthesise what has been derived, and offer a perspective on TPL within CMC which helps to make overall sense of the findings. The chapter considers the outcomes of the case in terms of wider potential generalisability. An analytical diagram is developed which attempts to capture the analysis of the impact of CMC on TPL, and to present it as a coherent theoretical phenomenon. I do not suggest this synthesis as ‘findings’ in the form of a final conclusion. The synthesis is rather the final stage of interpretation which attempts to look back at the case thus far, and capture it as a complex. Finally, I identify areas for further research which have arisen from the case.

7.2 SYNTHESISING THE CASE

7.2.1 The case as a complex

As a ‘complex’, the case has involved ‘critical borrowing’ (Snyder, 2002) from the fields of sociometry, textual hermeneutics and narrative theory. This has been to address issues raised within a relatively recent and undefined field, which can still be described as ‘chameleon’ (Snyder, 1998, p. xxv). Such borrowing has allowed the case to examine TPL within CMC as multifaceted, and has enabled me to adopt ‘focus-changing’ as an interpretive tool within a qualitative approach to understanding a complex. Focus-changing has enabled the case to be constructed from different perspectives. Each of the methods and its related perspective has contributed to an overall narrative which I have constructed to make sense of the phenomenon. Thus the case has developed by examining: the

‘relatedness’ between online texts, developed within sociometric theory; a theory of TPL in four parts, derived from qualitative content analysis; and a narrative analysis of the teachers’ accounts, which established sets of relations by which teachers are positioned within CMC and TPL. Chapters 4, 5 and 6 have each dealt with different data sets and conducted analysis from different methodological perspectives. The developmental nature of the case has been explicit, not only in the ways the interpretation has been shaped by different perspectives – critical borrowings – but also in my own learning process. This has been not only in adapting methods to work in an interdisciplinary way in this field, but in developing my own role as interpreter. In this final interpretation, I aim to develop a synthetic ‘view’ of the complex and establish an analytical coherence by which its parts make sense together. I consider the challenge of concluding a case which has developed through ‘chameleon’ elements; offer a synthesis of the interpretations made, and consider this in relation to relevant theoretical perspectives.

7.2.2 The case as a view of reality

A first concern in concluding the case is understanding what view of reality it offers. There is dispute as to whether a case should be complete within itself, or have wider implications within the field, i.e. there are differences between an ‘intrinsic’ and an ‘instrumental’ case (Stake, 1995) in contributing to knowledge, as explained in Chapter 3 (see 3.2). An ‘intrinsic’ approach to concluding a case can treat it as a complete instance of something in itself, there being no need to connect it with generalisable findings:

It is correct that summarising case studies is often difficult, especially as concerns case process. It is less correct as concerns case outcomes. The problems in summarising case studies however, are due more often to the problems of the reality studied than to the case study as a research method. Often it is not desirable to summarise and generalise case studies. Good studies should be read as narratives in their entirety. (Flyvbjerg, 2006, p. 241)

Whilst I have tried to make this case meaningful ‘in its entirety’, I explained in Chapter 3 (3.2) that its aims had both intrinsic and instrumental elements. Thereby I established it as a contextualised instance of ‘problems and questions in the field’ (Snyder, 1998, p. xxv),

those questions being to do with identifying the elusive nature of learning within CMC, requiring me to probe generalised beliefs about the impact of CMC, as a socio-constructivist learning practice, on TPL. Allied to this probing was the need to address a related question in the field – how can learning in CMC be researched? I have addressed both of these questions, and my conclusions have relevance to the particular instance of the teachers' learning on the MTeach (an intrinsic case outcome), but also to 'questions in the field' as outlined in Chapter 2, which framed the research (an instrumental outcome).

I have developed and constructed detailed knowledge about the practice and learning of these particular teachers, but this has an instrumental as well as intrinsic significance. The case has not been concerned with the teachers as fully realised individuals or psychological beings. This would have brought different emphases to the case process and outcomes. For example, I might have considered whether or not as a tutor, I should intervene more explicitly with individuals like P6 about being more 'interactive', and been explicit in considering as tutor and as researcher how he might gain from responding to what others had written. I might have considered what difference this might make to the overall learning within the group. I could not guarantee the effects of this however, given the differences identified between learners. I could not guarantee that, at a microlevel, intervention from myself as tutor would be heeded, or that it would bring about altered learning for the participant. P6 passed the module and his assessed coursework was comparable to others. What the difference would have been I cannot know. To act upon this 'insider' knowledge gained from the research would have developed an action research dimension by engaging in direct intervention in the phenomenon, establishing a different relationship with the 'reality' being investigated. This was not the research intention.

Whilst the teachers' individual articulations as online postings and interview narratives have formed the data, these have been viewed as situated within a social and collaborative context throughout the study. This context is one instance of an online learning community, and although each community is unique (Fayard and DeSanctis, 2005), its interpretation depends on working with existing knowledge in the field. It is only by this wider theoretical context that we can know if a community exists – the teachers do not tell us that in any

straightforward way, and certainly not universally. Thus the case has filtered the phenomenon itself. The ‘reality’ of the case lies in its properties as a narrative – it is a version of a bigger truth, the significance of which lies in its ‘verisimilitude’. The narrative not only frames the case, it *is* the case. A convincing case fulfils the narrative function of making sense of phenomena. To return to Bruner, (1985), the case represents how narrative is a ‘mode of thought’ – a way of organising knowledge about the world, gained by being in it, to make it meaningful. The narrative I have told of the research is a representation, by which I have ‘filtered’ the phenomenon as encountered through interpreting the data. It is a view of reality, and within qualitative research, offers a form of truth as knowledge about the world based on verisimilitude. That is the basis for its contribution as an ‘instrumental’ study, a way of understanding something other than itself, (Stake, 1995, p.3) – to develop understanding of the phenomenon of TPL within CMC, beyond the bounds of the particular instance which forms the context for the case.

The case therefore has meaning within the broader social contexts affecting teachers’ learning and the development of socio-constructivist approaches to CMC. The ‘local’ realities which are reflected in my analysis of TPL within CMC have an outward-looking perspective to wider contexts. The narrative of the case is an ongoing developmental one. I began by contextualising TPL within contemporary contexts which affect what teachers think, know and practice (see Chapter 2, 2.3) to act within the world. The research has made reference to these contexts in understanding the conditions which affect the way the teachers ‘see themselves’ and the factors which affect how they project themselves online as competent practitioners who are situated within dominant discourses of teaching. Contemporary contexts have been argued as inhibiting fully agentive dimensions of identity-building in CMC. The case context itself is contextualised by contemporary contexts affecting TPL – the managerialist and performative agendas discussed in Chapter 2, which affect discourses of the ‘good teacher’ (Moore, 2004). Thus, to synthesise the findings of the research, the case returns to itself - the context of its making within this world. Theory-building in Chapter 5 is not only applicable to this group of teachers, although it is situated by their practice. ‘Second wave’ research in learning with

technologies is concerned with understanding learning, but doing so through the lens provided by specific contexts, and this case is offered as one such lens.

7.2.3 'I' as researcher and verification

A second concern in concluding and synthesising the case is addressing the criticism that case studies are mainly confirmatory and susceptible to the verification of pre-existing ideas. Heeding Hammersley's (1992, pp. 183-203) advice that the data must be high quality, I would argue that the construction of the data has been considered within each method, and I have explored in detail the theoretical and practical aspects of the data collection. This is important, according to Hammersley, to ensure high quality data which have been carefully collected, as a basis for a case study which can contribute to theory-building beyond the bounds on the case itself. Most of all, the stance which has been developed by 'I-as-researcher' has been considered in terms of problems of verifying pre-existing ideas. Flyvberg (2006) does not consider this to be a problem – in fact he claims the opposite, that "the most advanced form of understanding is achieved when researchers place themselves within the context being studied...the researcher who conducts a case study often ends up by casting off preconceived notions and theories" (p. 236). Although I argue that the research has offered me, as an 'insider', forms of 'advanced understanding', this emphasis on being closely involved in the contextual specificities of the case has also created methodological challenges. This is part of the challenge for 'second wave' researchers, who investigate whilst being placed within highly situated CMC practices. Researching within the context has been a learning experience, and the development of methods which are situated within the case has led to a revision of previously held convictions concerning methodology.

I have learned the value of critical borrowing and adaptation of methods. The learning has not been so much in how to use and adapt the methods as such – although that in itself is worthwhile in introducing me to different perspectives on the same phenomena and the ways in which each method involves an intervention in the data. It is also about critical self-awareness of my interpretive role of researcher in a qualitative stance towards what

things mean. This development is characterised by a move from *seeking* evidence of TPL in the data, to interpreting the data to *establish* evidence. In adopting QCA as reported in Chapter 5, and narrative interviews in Chapter 6, I started out by trying to identify complex concepts in the teachers' declarative statements, on the surface of their online texts and in what they said in interviews, which would indicate agentive thinking within a conception they held of 'community'. Whilst there was much evidence of collaborative and agentive aspects in the data, the teachers could not articulate them to the extent I had expected. Their 'way of talking' was not what I expected, based on my expectations of them as their MTeach tutor. Instead, they articulated their practice as learners within CMC, and the ways they were trying to make sense of it. It was then for me to interpret the theoretical bases for their articulation, and that is what I establish in this final stage of the case. In Chapter 4, the process of mapping the online discussions taught me to refine the research focus to be socio-centric rather than ego-centric, and shifted concern away from individual personas as the main source of my developing understanding of learning in the online community.

These developments are important in refuting the criticism that a case approach is self- confirmatory. The views held by 'I-as-researcher' *do* shape what things mean, but interpreting within a culture does not invalidate the interpretation. We can only understand our culture by being in it, a part of it. Seeking to know is not about what Eagleton (2003) calls "some impossible light-in-the-refrigerator attempt to scrutinise ourselves when we are not there" (p. 60). The case has been confirmatory in that it has developed with reference to theoretical perspectives on learning, and found them consistently relevant to analysing the data. The data was meaningful according to these analyses, which were based on my interpretation of literature and contemporary contexts for TPL. I have not sought an 'outsider' perspective on these, and argue that my understanding could not be the same as an outsider's because it is shaped by my intellectual and experiential engagement with that culture. Being confirmatory of my position within the culture does not mean my relationship with it goes unchallenged or unaltered. My view of the nature of knowledge has been developed, and the way this relates to understanding the relationship between the texts and the meanings derived.

7.3 A THEORETICAL OVERVIEW

7.3.1 Key issues from the analysis of community and agency in TPL and CMC

This overview which attempts to achieve analytical synthesis is premised on the view that the learning of the teachers has to be seen within contemporary contexts. Chapter 2 established that the teachers are learning within a world comprised of two relevant contexts – firstly, dominant discourses of teachers' knowledge and practice, and secondly, CMC. These were shown in juxtaposition to introduce the case in Chapter 1 (1.3). The contexts were assessed as creating a paradoxical learning situation for them, as the claims for knowledge-creating possibilities and agentive socio-constructivist practice through CMC seemed in opposition to the realities of teachers' lives, circumscribed as they are by managerialist and performative policy-making (Standish, 2007). The examination of their online writing as a collaborative practice and interview transcripts has revealed aspects of this paradoxical situation, as expressed in the summary of findings in Chapters 5 and 6:

...the need for agency is not fully addressed, in that the practice is encouraging of counter-discourses and disruptive thinking but that elements of hegemony, ideological co-option and pragmatism all feature in the discussions and curtail the agentive potentials of the online discussions. (5.6)

The teachers appear to occupy different stances within the sets of relations at different times, and this prevents a definitive identification of their learning as containing community and agentive perspectives. They become 'positioned'. (6.6)

It appears that Oliver's (2003) assessment is appropriate when he claims that learning with technologies is a process of 'dynamic evolution' rather than revolution. These teachers are not in a position to know themselves as 'revolutionaries' within their identities as teachers and as learners. This is not an appealing self-image, even though their practices and their thinking may be counter to dominant narratives of teaching and learning in contemporary society. They cannot name agency and community in their definitions of themselves and what they do. They resist the 'congealing into thingness' of these concepts, which Wenger argues is what happens when a COP ascribes meanings to professional phenomena. They thus lack the fully developed 'agentive identities' which Sachs (2003a) calls for, in terms of

meta-knowledge of themselves as teachers. At the same time, they are unsettled by the learning practices they engage with, and at times occupy agentive personas and ways of talking. They cannot fully inhabit identities as agentive within a COP, but the interpretation has found them to be reflexive, self-aware, and capable of meta-learning. Their role in constructing knowledge as a text-based interdependent practice has been made explicit for most, but not all. Furthermore, they still seek face to face ways of being a ‘community’. The constellation of perspectives they adopt, with varying degrees of meta-engagement with their own situation, requires a theoretical synthesis within the case. This is the final stage of the case – the interpretation of what has been interpreted.

7.3.2 A model of TPL within an online COP

CMC within this case forms a continuum with previously existing socio-constructivist learning practices which centre on the concept of ‘joint thinking’, by which a participant intervenes in the learning of another. When asking ‘what is the impact of CMC on this process?’, it has been argued that CMC affects the ‘educational transaction’ (Garrison and Anderson, 2003, p. xi). This is by affecting the achievement of interdependent thinking, by enabling the teachers to become ‘thinking participants’ who intervene in the ideas of others over time, by text-based interaction. The theory of TPL in CMC developed in Chapter 5 (5.4.4.2) suggests there are four components to this impact on the educational transaction: social bonds; ways of talking; meaning-making in a COP; and learning and identity. Such a theory involves a review of what constitutes teaching and learning, and the roles of teachers and learners. The inseparability of social and cognitive presence extends to teaching and learning roles, and is the basis of Garrison and Anderson’s concept of the ‘educational transaction’. I argue that, in the context of professional learning communities, this inseparability takes a particular form, which can be identified as ‘relations of learning’. These relations are both constructed by the teachers’ online COP, and constitute it. As a COP, social and cognitive presence are realised as Wenger’s twin politics of ‘participation’ and ‘reification’, by which professional learning phenomena are rendered meaningful. Social and cognitive presence, and participation and reification, share a focus on the interconnection between personally constructed meaning and the social refinement and

alteration of understanding which takes place collaboratively. For Garrison and Anderson, the transaction is created within a community of inquiry – the transaction *is* the essence of the community, as the twin politics are the essence of Wenger's COP. From my analysis of the case data, the educational transaction in TPL is comprised of relations.

Analysis of the interviews suggested that relations between thinking participants are essential to the transaction, and are constantly negotiated between individuals as they interpret their practice in response to online readings and peer-authored contributions. The model in Figure 7.1 is one I have developed to represent TPL within an online COP which is discernible in the MTeach online environment. It reflects the contextualised constituent elements of TPL within CMC which can be described according to theories of collaborative learning which have been key to the case. The elements of TPL in CMC are constitutive of: Wenger's concept of the *participation* and *reification* of professional phenomena; of the 'educational transaction' within Garrison and Anderson's community of inquiry; and of Koschmann's 'conjointly conducted inquiry'. Within this model, the relations that exist between texts, the individual learner and peer discourse constitute the development of practice-based professional knowledge.

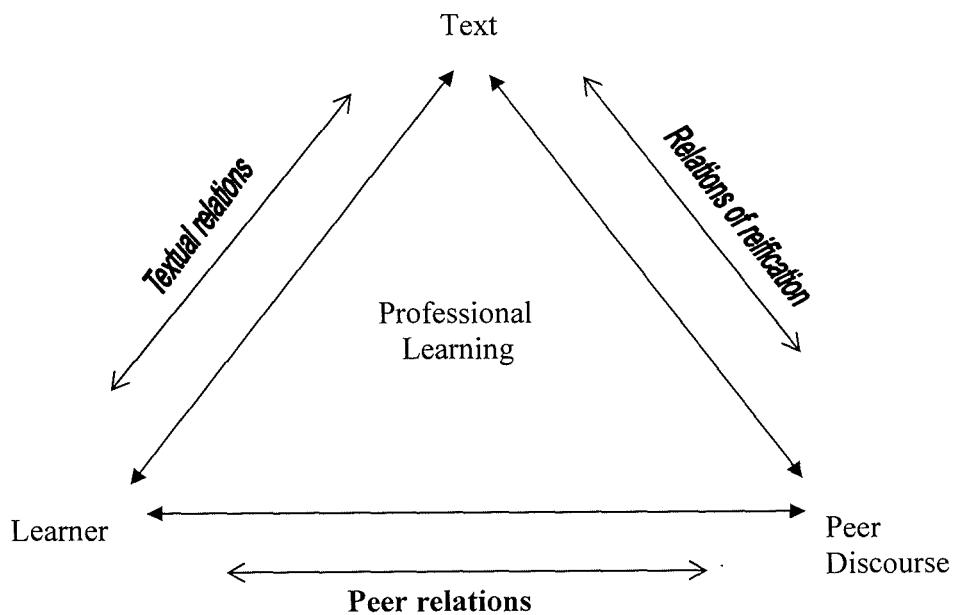


Figure 7.1 Teachers' professional learning within an online COP

Social and cognitive presence, as identified using the QCA model, are part of the triad of relations by which an individual is connected with their peers and with the online texts. The relations affect the meanings which can be made. They constitute TPL as a process, by which meanings are negotiated and affected by the way a teacher is positioned within these relations. They are not static, and the analysis has suggested a state of inconsistency and change within individuals, as well as within the group as a whole. Context-making, from this perspective, is indicative of the notion of evolving learning in CMC as an ‘uncertain process’ (Andriessen et al. 2003, p. 2). The notion of movement or change within these relations I have thought of as different ‘trajectories’ which the teacher as learner makes within their learning. This is a way of seeing them both positioning themselves in relation to their peers and the texts, and also being positioned. It does not imply an intentional ‘journey’ of any sort, but a description of the learning as part of a social and textual dynamic. As Yandell and Turvey have noted (2007), “Learning communities, as Wenger (1998) argues, need to ‘make trajectories possible...offer a past and a future that can be experienced as a personal trajectory’ (p. 215)” (p. 546). It is a descriptive model, not a pedagogical design, and acts as a synthetic tool to explain the findings of the case and thus, in the nature of case-building, develops its final stage of interpretation. It is a means by which it is possible to understand how a “‘self’ and its ‘world’ are constituted and coordinated” (Schostak, 2002, pp. 18-19) within a context.

Figure 7.1 therefore presents an overview of TPL within CMC in diagrammatic form, which captures it as a complex constructed of practices in which relations constitute learning. The inner arrows reflect that different relations affecting learning are formed between the individual, peer discourse and online texts. The outer arrows reflect the types of relations which are made by these three elements in TPL: peer relations, textual relations and relations of reification (as analysed in 6.4). They reflect the interdependent nature which was identified in the relations, and emphasise that texts are to be interpreted by, and take meaning from, those who engage with them – as both individuals and as a collaborative rendering of meaning. The trajectories do not imply a ‘place’ which the teacher has reached, but imply a state of shift and negotiation among the participants in

which they are positioned and engage in meaning-making which is based upon both individual difference and collaborative reification. The COP is constituted in individual difference, which is reflected in the types of trajectories they take between individual cognition, collaborative meaning-making and online texts. It is an indication of interdependence not being equal for all participants, but all of them are part of the practice and positioned within its learning relations.

Learner-text trajectory: Learners are positioned according to how they view text-reader-author relations, how they view their relationships with the texts they read. It is affected by how they perceive texts as embodying provisional thinking, or containing unified, authoritative meanings, and the extent to which they seek to replicate such texts in their online exchanges.

Learner-peer discourse trajectory: Learners are positioned by the peer relations within the group, and their own orientation to knowledge acquisition and interdependence through interaction. This trajectory falls within a range of constructivist learning perspectives, and the extent to which they are individual/cognitive or socio-cultural.

Peer discourse-text trajectory: Learners are positioned by the extent to which they participate in group discourse which engages in processes of reification of professional phenomena, by collaboration in meaning-making in response to text. This learning takes place through the forging of shared professional belief systems and discourses of practice. It falls within a participatory learning perspective, related to the development of corporate professional identity and agency. These relations have a strong relevance to ‘sociogenic’ perspectives on CMC, proposed by Koschmann (2003). He argues that learning can be viewed as ‘sociogenic’, meaning that interdependent learning is rooted in the harnessing of the resources available within a community of learners, who do not all have to directly make contact with each other.

This way of perceiving the constituent elements of TPL in CMC began to emerge in Chapter 4, with the exploration of the ‘relatedness’ of online texts. This led to a shift from

thinking in terms of the teachers ‘exchanging’ or even ‘interacting’ to considering the ‘concatenation of indirect linkages’ between texts which might constitute learning relations in online discussion, and which can be made visible by QCA:

I would revise my use of the term ‘exchange’ as I no longer think they *exchange*. *Interaction* is also problematic as the density is low and there is relatively little movement back and forth and little evidence of conversational response patterns. What there is however, is a shift to the importance of the network itself as affecting learning. Scott (2000) argues that, in using sociometry applied to the field of social networks, “the power of a network over its members is not mediated only through their direct links. It is the concatenation of indirect linkages, through a configuration of properties that exist independently of particular agents, that should be at the centre of attention” (p. 75). (4.3)

As the case has developed, a ‘sociogenic’ (Koschmann, 2003, p. 264) view of learning within CMC has become more significant. This includes not only the appropriation of cultural tools and practices for argumentation, but also their evolution over time. Learning is seen as “a process of restructuring a socially-organized activity” (*ibid.*), in which the online writing is key. By engaging with CMC, the teachers are involved in ‘restructuring’ processes, involving both restructuring of knowledge and understanding of concepts, and also, essentially, reformulating ideas about what it is to practise as a learner/teacher in a collaborative online context. It is possible to view TPL in the case as a process of acquisition of a complex socio-material system rather than a matter of individual cognitive transformation. This focus on engaging with evolutionary tools for the conceptualisation of learning is relevant to the triad of relations in Figure 7.1. The analysis within the case suggests that the teachers, through CMC, articulate their part in a process of change with a variety of perspectives on their own positions within that change. In the interviews, they articulate not only their own individual developmental histories as professionals, but their part in an altered cultural realisation of what learning might involve in a professional context, of the possibilities of how learning is organised and realised within collaborative contexts. It is coherent with the sociogenic basis for Koschmann’s (2003) theory of ‘distributed cognition’. He stresses this is only one among other theoretical views of learning within a discourse community, and that a convergence is needed to overcome views which assign learning as either ‘social’ or ‘individual’. The overview I express

within the diagram emphasises the interdependence between individual learning and collaboration as it is interpreted in this case. It becomes obvious that polarised conceptions of ‘autonomous’ and ‘collaborative’ learning are inadequate to describe the features of TPL in CMC. The learners themselves express multiple and contradictory experiences of these. Instead, learning within online writing is viewed as a combination of individual-cognitive and social-interactionist processes, i.e. as interdependent. This overview of the case as a complex shows how it is related to wider questions about TPL and CMC, which were examined in Chapter 2 and summarised by Fisher et al.,: “There is very little fundamental research that investigates **how** teachers might learn with digital technologies” (2006, p. 2). They argue that wider questions have been insufficiently addressed, and I propose that this case contributes to understanding ‘how’ teachers learn through practices involving CMC.

In the case, teachers’ professional learning is expressed as an increased inquiry into practice. It is about processes of meaning-making with CMC, which involve teachers in practices which affect community membership and identity, rather than finding ‘answers’. The COP is an effect of the ways individuals are connected to their peers and texts by meaning-making processes. By ‘ways of talking’, they position themselves and are positioned within the relations of learning in an online COP. They are positioned in relation to what they are learning and how they are learning, and how they understand learning as a collaborative practice. The trajectories are about how they participate in the educational transaction and affect how they ‘inquire’ (Garrison and Anderson, 2003). Talking within practice is about establishing and articulating these trajectories. The relations, and where they are positioned at any time, are a way of understanding a ‘knowledge age’ (Andriessen et al., 2003) concept, that learning with CMC is about ‘who we become’ rather than ‘what we know’. The relations offer a way of conceptualising TPL as process-orientated, rather than product-orientated. The model I derive is my way of seeing learning as process and acknowledging its constituent parts, viewed through the lens of the case. It aims to represent the private and the public, the individual and the collaborative, the cognitive and the social. They are not ‘weighted’ within the diagram, because it attempts to show interdependence and the capacity for variability within that. The case is able to give context to the abstract concept of ‘sociogenic’ learning, without which an understanding of it as

operating within a particular culture is hard to achieve. It is by developing the case that such a theory can be situated, and thus more fully understood .

7. 4 CONCLUSION

7.41 Learning as process

This self-conscious engagement in the learning of others exists as part of a continuum in socio-constructivist learning practices from face to face contexts. CMC can be argued to be an ‘evolution’ of learning practices, based on altered social interaction embedded in engaging in literate behaviours. But the participants are not used to it, and it takes considerable processes of adjustment. The biggest learning in their meta-level understanding is of this as a learning process and of the ability to articulate collaborative learning processes. This is indicative of learning in the ‘knowledge age’ but vestiges of ‘information age’ orientations exist, and processes of adjustment are evident in the teacher data.

Chapter 2 included Mercer’s (1995) warning that a theory based on ‘pooling mental resources’ must be used with discrimination in new contexts, and that adaptation is needed. Mercer’s definition of scaffolding included in 2.2.4.2 can be extended to the online context because the teachers are ‘self-consciously trying to teach and learn’ to construct knowledge as a

social, historical process...the knowledge that is created carries with it echoes of the conversations in which it was generated... knowledge can be created out of the conflict of ideas as much as through accumulation and combination of them...one person can become actively involved in another’s learning activity, in such a way that the learner has an active role and yet is able to progress further and more easily than they could have done alone (1995, p. 84-85).

There is evidence in the content analysis in Chapter 5 and in the interviews in Chapter 6 that the teachers are engaged in a form of scaffolding to construct knowledge. There are differences however, within an online practice which pools mental resources, where texts

are the vehicles by which individuals intervene in the learning of their peers. The analysis has shown that the literate nature of these interventions brings further complexities to do with presenting the professional self online, which affects the twinning of cognitive and social aspects of learning. The significant finding is that the teachers are learning explicitly about their own practice of engaging with TPL within CMC. Although on the surface, the online discussions focus on ‘topics’ to do with research literacy, that is not the most significant aspect of the professional learning in the group. Of course there is a connection between the module subject matter – teachers and research literacy – and the teachers’ focus on their own learning. It may well be that having to think about what they know and understand about educational research will impact on their wider considerations of themselves as teachers who are learning. Lea’s (2000) analysis that learning in online discussion is mostly affected by course philosophy is relevant to the case, but it does not mean however, that their development of self-awareness and agentive and collaborative dispositions was inevitable.

Rovai’s argument (2002) that community is ‘what people do together’, rather than where and by what means, is hard for the teachers to internalise and ‘know’. They learn to practice in a teachers’ online community by practising. The ‘educational transaction’ for Garrison and Anderson means being able to foster cognitive independence and social interdependence at the same time *within* practice. When applied to a COP, participants need to be able to achieve this to ascribe meaning to professional phenomena – to render things *meaningful* among practitioners, which is key to acting agentively. It requires critical engagement with practice. The analysis has addressed how far the teachers engage critically, and has found this to be problematic. They resist the term ‘community’ although show evidence of engaging with the practices which constitute a community. They do ‘disrupt’ orthodox discourses of teaching and learning by what they say and how they say it – by talking within practice. The agentive dimension is important to establishing a COP, because community is not reliant upon consensus – it is not about reproducing practice, but about inquiring critically into practice as part of process which brings about changes in practice itself and involves altered professional identities. There is disruption – they do ‘fill with content’ the online writings from independent and critical perspectives in many ways,

as shown in the textual analysis in Chapter 5. But, their views and projections of themselves as teachers are also circumscribed by extrinsic contexts which constitute discourses of teaching which affect how they want to present themselves and how they practice. There is nothing causal about CMC developing agentive identities, as was interpreted in Chapter 6 (6.5). The sets of relations in how it occurs as a practice are what contribute to agency. Power relations are at play and represented in the model, Figure 7.1.

Agency as core to TPL was identified in Chapter 2 as “the relationship between the inner-self in articulation with the external actor”, and this affects identity. Sachs (2003a) commented on agency:

Teacher identity stands as the core of the teaching profession. It provides a framework for teachers to construct their own ideas of ‘how to be’, ‘how to act’ ‘how to understand’ their work and their place in society. Importantly, teacher identity is neither fixed nor imposed; it is negotiated through experience and the sense that is made of experience (p. 135).

The point was made in the literature analysis that this is harder than it sounds in contemporary contexts. The analysis in the case has suggested that ‘harnessing intellectual resources’ is extremely complex. In the summary of agency within TPL and CMC, I said (2.3.3.5) it requires “self-determination” and it “requires the teaching profession to constitute *itself*, and teachers *themselves*”. The research has developed how I understand this. I would now argue that ‘harnessing intellectual resources’ in TPL involves teachers in constituting their *learning practices* and constituting *themselves as learners*. Agency however, remains a difficult concept for the teachers to engage with at a meta level, because it requires the teachers to see their condition *as part of* their condition. That is a core difficulty in achieving agency within TPL in the case. Wenger helps an understanding of just how difficult this is, when he argues that the processes involved in learning in a COP are disjointed through time: “the world and our experience are in motion, but they don’t move in lock-step. They interact, but they do not fuse...In moments of negotiation of meaning, they come into contact and affect each other” (1998, p. 87). It is the asynchronous dimension which is key here. The transformations which occur in teachers’ understanding of their practice are articulated through the contact *over time* with peers in

online exchange. There is no ‘lock-step’ understanding of their learning and of their condition. The model reflects that, as a complex, their learning is constituted by experience within a world affected by CMC. In this world, texts and peer discourse are brought together with individuals in moments of ‘experience’, which affect their relations with each other. The relations of learning are constantly renegotiated, so that learner trajectories are forged and re-forged, by which individuals occupy different positions in relation to the meanings of practice which emerge within the community. Learning is thus constituted by the sociogenic factors within the discourse community and is a process of continuous acquisition and development of learning processes. The need for a focus on learning *as process* in technological environments has been highlighted by Levy (2006), who suggests that development within the ‘process’ domain of knowledge (learning to learn) impacts positively on e-learners’ progress within the subject or content domain. Such considerations have scarcely been acknowledged to date in the widening adoption of e-learning practices for teachers’ CPD (Fisher et al., 2006). It is however, an outcome of this case that the key impact of CMC on TPL is on the participants’ learning as process.

7.42 Summary of main findings

The main findings are summarized as follows:

- TPL within CMC is essentially process-oriented. The main impact on teachers is on their awareness of being participants in collaborative and co-constructive knowledge-making processes.
- TPL is present in the form of sets of ‘relations’ which position the teachers in relation to each other, to the online writing of others, and to the meanings which are made. The relations are not fixed, and this is why meanings are provisional, as teachers negotiate their own relationship with the group process of reification, or ‘meaning-making’.
- The group can be identified as an instance of a community of practice. This is because of the way it engages with the twin processes of participation and reification of professional phenomena, in a way which establishes what things mean

over time. The teachers do not necessarily recognize themselves as a community, and in fact some dispute that 'community' exists, despite articulating their practices as ones which can be identified according to Wenger's theory of CoPs.

- Agency is a problematic goal for TPL with CMC. There are multiple socio-political factors at work which impact on teachers' development of critical and independent thinking. There is evidence that hegemonic processes affect the negotiation of meanings within the online discussions.
- TPL in the online tutor group can be identified as an instance of Koschmann's (2003) 'sociogenic' theory of CMC in practice. The teachers are aware of having engaged in the process of debating 'virtually' the core issues related to professional topics, but recall of the content of debate itself is vague. What persists in their consciousness is a sense of having engaged at a distance in collaborative processes which disrupt their previous convictions and practices about learning and teaching. Thus the main transformative impact is on their identities as teacher-learners, rather than on subject-oriented cognitive change.
- Methodologically, Garrison and Anderson's (2003) model for QCA has been shown to have potential for identifying conceptual work in online discussion. It has been shown that the model needs to be adapted to reflect the learning categories which pertain to a particular field of inquiry, and that critical application of it as a research instrument is vital to address the complexities of specific learning contexts.

These findings are relevant to contexts for providing teachers' CPD, but also to wider audiences including policy-makers, teacher educators and teacher researchers. They support the move away from positivist expectations of research into CMC and what it can offer, and emphasise that issues of identity, criticality and collaboration are key features of professional learning. The findings resist the notion that communities of practice can be 'prescribed' or legislated for in CPD contexts. They are complex and shifting, and engage participants in ways which are non-confirmatory of prior experiences and expectations about learning. They do not offer solutions to problems, but affect the thinking of practitioners who will be responsible for finding solutions. Provisionality – of social relations and of thinking - is core to how they work, and future design for online COPs for

CPD needs to allow for uncertainty, difference and dispute amongst learners. Learning takes place over time, and is focused on processes, not outputs.

7.5 DIRECTIONS FOR FURTHER RESEARCH

The analysis of the case developed in Chapters 4 – 7, suggests three main areas of the impact of text-based CMC on TPL which require further investigation. One is the potential impact of tutor presence on teachers' learning – the third area of Garrison and Anderson's (2003) community of inquiry, which they call 'teacher presence'. The second is to do with further testing of the QCA methodology devised by the case, to investigate its wider applicability to other teachers' online discussion communities. The third is desk-based work to investigate recent theoretical developments in the field of collaborative learning, and to address the need to further understand the nature of 'interdependent' learning within an online community. This section aims to give a brief overview of the main recommendations for the development of further investigation of TPL within CMC, based on this study.

Teacher presence

Further study is needed to widen the data collection to take account of tutor presence and its possible impact on TPL in CMC. The case study QCA methodology focused on intensively investigating two of the three aspects of Garrison and Anderson's (2003) community of inquiry – social and cognitive presence, and excluded teacher[tutor] presence. The rationale for this, presented in 3.5.13, emphasised the focus on collecting data of teachers' construction of meaning as the basis for this study. I adopted a theoretical stance in defence of this, based on querying the tutor-centric aspects of Laurillard's Conversational Framework (2002), and on disputing the accompanying theory of 'first order' and 'second order' knowledge on which it is premised as being problematic in the context of professional learning. This querying stance requires testing out by research which includes 'teacher[tutor] presence' as a third element for the analysis of online writing. This research

demanded intensive investigation of the data, and the imposition of workable and justifiable parameters. Further research would allow the third element to be examined, and any impact to be identified once this was introduced as a data set. This would make it possible to see whether 'teacher[tutor] presence', whatever its form (given the minimal tutor intervention already explained in the study) made any impact on the case findings concerning TPL. Teacher[tutor] presence includes not only tutor postings, but such factors as the impact on the content of online discussion of pedagogical design and course ethos as conveyed by tutors. This third element would therefore allow for course philosophy to be investigated for possible impact on teachers' learning in CMC, which has been acknowledged as a potential underlying factor throughout the case, in reference to Lea (2000) and Rovai (2002). In addition to including teacher[tutor] presence in the QCA methodology, interview data is needed from teachers about their perceptions of the course, which was not a focus of the interviews for the study.

The QCA methodology

The model I devised to conduct QCA has been piloted and applied within this study, and requires further testing out in other teachers' online learning communities. Garrison and Anderson (2003) recommend that their model be developed to address specific contexts, and this study has been the start of one such adaptation. It now needs to be applied more widely to see whether: i) the method is appropriate to other contexts of TPL and ii) whether different findings emerge in other contexts, and how these relate to those in this study. This would help establish the contribution of the model to developing a generic methodology for the analysis of TPL in online contexts, and what degree of customisation may always be needed. The pilot established the need to revise the categories and indicators to reflect more closely the situated context in which TPL was being researched. It also established the need for a further level of 'specific elements' of TPL to be introduced, to fully adapt the model to interrogate the teachers' online writing. The process of 'critical borrowing' involved considerable transformation of the model, and to date I am not aware of any other 'borrowings' from this model, in TPL or other areas, despite its wide publication. Further application in other contexts would allow an analysis of its methodological usefulness in a

field which is becoming mature but, due to its inter-disciplinary nature, is still developing protocols for undertaking research of this sort.

Theoretical developments

Recent theoretical developments in the field of learning in CMC have the potential to contribute to further analysis of the data, and to frame questions for future research concerning TPL in CMC. Three key theories have become influential – Koschmann's (2003) 'sociogenic' theory of learning, which has informed the concluding analysis of the case; Suthers' (2005) theory of 'intersubjective learning' and Stahls' (2006) work on group cognition. These differing theoretical positions have each tried to address the fundamental question of how learning happens in a collaborative or social context of online discussion, and the relationship between group learning and individual knowledge and understanding. Suthers (2005, pp. 662-3) suggests a range of ways of conceptualising collaborative learning. The most relevant of these to the way this case has developed is 'intersubjective learning', which goes beyond information sharing to include the sharing of interpretations and the joint creation of interpretations through interaction, and includes disagreement. Learning is not only brought about through interactions of participants but also consists of those interactions, so that the process of meaning making is constituted by social interaction. 'Intersubjectivity' is potentially a way of seeing Mercer's (1995) interpretation of 'scaffolding' adapted to the context of CMC. This concept suggests, like Koschmann's, the importance of learning as a process in CMC, by which a person's capacities for thinking are altered by collaborative practice. Stahl's (2006) theory of 'group cognition' is based on the group, rather than the individual, as the unit of analysis in investigating the effect of collaboration on learning. He argues that online groups have the capacity to develop intersubjective knowledge which exists beyond that which is known by individual members. Each theory has a different emphasis in terms of the relationship between individual and group production of knowledge, and what such knowledge might consist of. This focus on what is known individually, and what is group knowledge, has grown in importance throughout the case. All three theories are concerned with 'how' people learn in CMC contexts, which we know from Fisher et al. (2006) is a neglected research area in

TPL. Further analysis of the data in relation to these recent theories would provide a further dimension to the description of TPL in contemporary contexts.

7.6 SUMMARY

This chapter introduced the conclusion to the case by focusing on two concerns. The first is regarding the generalisability of the case outcomes, and its potential contribution to theory-building. It argues that this case has implications for understanding existing theoretical perspectives on wider issues within the relevant fields, namely exploring the socio-constructivist essence of TPL within CMC. It argues that the case as a narrative offers a filtering of the reality observed, and acts as a ‘lens’ by which a valid interpretation can be contributed of a social phenomenon. It then reflects on how this interpretation can be defended against the charge of being self-confirmatory, and argues that in order to research qualitatively within a culture, a researcher must be part of the culture, and that the interpretations offered therefore have meaning as part of that culture, because they are conditioned by it.

The second concern is to offer an analytical synthesis of the case, based on a representation of the findings in previous chapters in the form of a diagrammatic model for TPL within CMC. The model represents a triad of constituent elements of TPL within CMC, comprised of individual learners, texts and peer discourse. These form a COP in which relations of learning exist between all three, which affect the meanings which are fostered within the community. It is acknowledged that community and agency within these relations are circumscribed by wider contexts affecting the teachers’ realisations of themselves as agentive within a COP. Learning trajectories and the positioning of teachers within the COP are not intentional, and are affected, but not determined, by CMC within a constructivist course approach. The model is a representation of how both Wenger’s twin politics of participation and reification, and Garrison and Anderson’s (2003) concepts of social and cognitive presence in a community of inquiry, are brought together in the case context in the form of ‘relations’ which constitute learning.

Finally, the model is interpreted as reflecting aspects of Koschmann's (2003) theory of 'sociogenic' learning as a perspective on learning in CMC. This brings a different interpretation to notions of 'interaction' as learning, and focuses rather on learning as process within the case, by which teachers' learning is a matter of engagement within the community which affects identities. This offers a final perspective on what is the basis of the 'educational transaction' as used by Garrison and Anderson to underpin their model of a 'community of inquiry', and the basis of the twin politics of Wenger's COP. *Learning as process* emerges as a way of conceptualising TPL within CMC, in a way which synthesises the different theoretical concepts developed throughout the case.

REFERENCES

Abbot, J. (1994) *Learning Makes Sense: Recreating Education for a Changing Future* Letchworth: Education 2000.

Anderson, T. and Kanuka, H. (2003) *E-Research: Methods, Strategies and Issues* Boston: Allyn and Bacon.

Anderson, T., Rourke, L., Garrison, D. and Archer, W. (2001) 'Assessing teaching presence in a computer conferencing context', *Journal of Asynchronous Learning Networks* 5(2) 2-17. Available at: http://www.sloan-c.org/publications/jaln/v5n2/v5n2_anderson.asp (accessed on 06.09.03).

Andriessen, J., Baker, M. and Suthers, D. (2003) 'Argumentation, computer support, and the educational contexts of confronting cognitions', in J. Andriessen, M. Baker and D. Suthers (eds) *Arguing to Learn: Confronting Cognitions in Computer-supported Collaborative Learning Environments* Dordrecht: Kluwer Academic Publishers.

Bakhtin, M. (1986) *Speech Genres and Other Late Essays*, in C. Emerson and M. Holquist (eds) V.W. McGee (trans.) Austin, Texas: University of Texas Press.

Ball, S. (1998) 'Educational studies, policy entrepreneurship and social theory', in R. Slee, G. Weiner and S. Tomlinson (eds) *School Effectiveness for Whom?* London: Falmer.

Bamberg, M. (1997) *Narrative Development: Six Approaches* London: Lawrence Erlbaum.

Barnes, B. (1974) *Scientific Knowledge and Sociological Theory* London: Routledge and Kegan Paul.

Barnett, R. (1994) *The Limits of Competence* Buckingham: Open University/Society for

Research into Higher Education Press.

Baron, N. (2000) *Alphabet to Email* London: Routledge.

Bassett, E. and O'Rordan, K. (2002) 'Ethics of internet research: contesting the human subjects research model', *Ethics and Information Technology* 4(3) 233-247. Available at: http://www.nyu.edu/projects/nissenbaum/projects_ethics.html (accessed on 06.09.03).

Bernstein, B. (1996) *Pedagogy, Symbolic Control and Identity. Theory, Research, Critique* London: Taylor & Francis Ltd.

Black, H. and Woolf, A. (1990) *Knowledge and Competence: Current Issues on Training and Education: A Collection of Papers* London: Careers and Occupational Information Centre/HMSO.

Blake, N. (2000) 'Tutors and students without faces or places', *Journal of Philosophy of Education*, 34(1) 183-196.

Blommaert, J., Creve, L. and Willaert, E. (2004) 'On being declared illiterate. Language-ideological disqualification in Dutch classes for immigrants in Belgium'. Paper presented for position of Chair in the School of Culture, Language and Communication at the Institute of Education, University of London, Spring 2005.

Bogdan, R. and Biklen, S. (1992) *Qualitative Research for Education: An Introduction to Theory and Methods* London: Allyn Bacon.

Bolam, R., McMahon, A., Stoll, L., Thomas. S. and Wallace, M. (2005) *Creating and Sustaining Effective Professional Learning Communities* London: Department for Education and Skills.

Borland, K. (1991) ‘‘That’s not what I said’: interpretive conflict in oral narrative research’, in S. Guck and D. Patai (eds) *Women’s Words: The Feminist Practice of Oral History* London: Routledge.

Boyer, E. (1990) *Scholarship Reconsidered: Priorities of the Professoriate* Princeton, New Jersey: Carnegie Foundation for the Advancement of Teaching.

Bradshaw, P., Chapman, C. and Gee, A. (2002) *A Report on the ULTRALAB’s Development of Online Components in NCSL Programmes* Chelmsford: Ultralab.

British Educational Research Association (2004) *Revised Ethical Guidelines for Educational Research* Nottingham: BERA.

Brown, A. and Dowling, P. (1998) *Doing Research/Reading Research: A Mode of Interrogation for Education* London: Falmer Press.

Bruner, J. (1985) ‘Narrative and Paradigmatic Modes of Thought’, in E. Eisner (ed) *Learning and Teaching the Ways of Knowing* Chicago: University of Chicago Press.

Capurro R. and Pingel, C. (2002) ‘Ethical issues of online communication research’. Paper presented at Computer Ethics: Philosophical Enquiries (CEPE) conference, December 2001. Available at: http://www.nyu.edu/projects/nissenbaum/projects_ethics.html (accessed on 10.10.03).

Clandinin, D. and Connelly, F. (1995) *Teachers’ Professional Knowledge Landscapes* New York: Teachers College Press.

Clandinin, D. and Connelly, F. (2000) *Narrative Inquiry* San Francisco: Jossey-Bass.

Cochran-Smith, M. (2003) ‘Learning and unlearning: the education of teacher educators’, *Teaching and Teacher Education* 19 5-28.

Cohen, L., Manion, L. and Morrison, K. (2000) *Research Methods in Education*, Fifth Edition, London: RoutledgeFalmer.

Cole, M. (1996) *Cultural Psychology: A Once and Future Discipline* Cambridge, MA: Belknap Press of Harvard University Press.

Cortazzi, M. (2001) 'Narrative learning in clinical and other contexts'. Paper presented at Brunel University Education Department Research Conference, 17th and 18th July 2001.

Decortis, F. (2004) *Survey of Narrative Theories for Learning Environments* European Commission, Kaleidoscope. Available at: <http://telcarn.noc-kaleidoscope.org/warehouse/Decortis-Kaleidoscope-2005.pdf> (accessed on 10.03.05).

Dede, C. (2006) *Online Professional Development for Teachers* Cambridge, MA: Harvard Education Press.

Department for Education and Skills (2001) *The Teachers' Standards Framework* London: Department for Education and Skills.

Dewey, J. (1938) *Experience and Education* New York: Collier Macmillan.

Diani, M. (2000) 'Social movement networks virtual and real', *Information, Communication and Society* 3 386-401.

Diani, M. and McAdam, D. (2003) *Social Movements and Networks: Relational Approaches to Collective Action* Oxford: Oxford University Press.

Doecke, B. and Gill, M. (2001) 'Setting Standards: Confronting Paradox', *English in Australia & Literacy Learning: The Middle Years*, Standards for Teachers of English Language and Literacy (STELLA) 5(16).

Eagleton, T. (1983) *Literary Theory* Oxford: Blackwell.

Eagleton, T. (2003) *After Theory* London: Penguin Allen Lane.

Edwards, D. and Mercer, N. (1987) *Common Knowledge* London: Methuen/Routledge.

Employment Department (1992) *Learning through Work* Sheffield: Employment Department, Higher Education Branch.

Eraut, M. (1997) 'Perspectives on defining "the learning society"', *Journal of Education Policy* 12(6) 151-158.

Eraut, M. (2000) 'Non-formal learning, implicit learning and tacit knowledge in professional work', in F. Coffield (ed), *The Necessity of Informal Learning* Bristol: Policy Press and Economic and Social Research Council Learning Society Programme.

Evans, K., Hodkinson, P. and Unwin, L. (2002) *Working to Learn: Transforming Learning in the Workplace* London: Kogan Page.

Fahy, P. (2003) 'Indicators of support in online interaction', *International Review of Research in Open and Distance Learning* 4(1), article 6. Available at: <http://www.irrodl.org/content/v4.1/fahy.html> (accessed on 10.01.04).

Fairclough, N. (1992) *Critical Language Awareness* London: Longman.

Fayard, A-L., and DeSanctis, G. (2005) 'Evolution of an online forum for knowledge management professionals: a language game analysis', *Journal of Computer-Mediated Communication* 10(3).

Communication 10(4), article 2. Available at:

<http://jcme.indiana.edu/vol10/issue4/fayard.html> (accessed on 10.09.05).

Feenberg, A. (1989) 'The written word', in R. Mason and R. Kaye (eds) *Mindweave, Communication, Computers and Distance Education* Oxford: Pergamon.

Fielding, M., Bragg, S., Craig, J., Cunningham, I., Eraut, M., Gillinson, S., Horne, M., Robinson C. and Thorp, J. (2005) *Factors Influencing the Transfer of Good Practice* London: Department for Education and Skills.

Finnegan, R. (2003) 'Meaning and Learning'. Keynote lecture, The Learning Conference: What Learning Means, Institute of Education University of London, June 2003.

Fisher, T., Higgins, C. and Loveless, A. (2006) *Teachers Learning with Digital Technologies: A review of research and projects* Futurelab series, No 14. Available at: http://www.futurelab.org.uk/research/lit_reviews.htm#lr14 (accessed on 20.12.06).

Flyvbjerg, B. (2006) 'Five misunderstandings about case study research', *Qualitative Inquiry* 12(2) 219-245. Available at: <http://flyvbjerg.plan.aau.dk/Publications2006/0604FIVEMISPUBL2006.pdf> (accessed on 01.03.07).

Freund, E. (1987) *The Return of the Reader* London: Methuen.

Frey, L. (1994) 'The naturalistic paradigm: studying small groups in the postmodern era', *Small Group Research* 25(4) 551-577.

Fullan, M. (2001) *Leading in a Culture of Change* San Francisco: Jossey-Bass.

Furlong, J. (2000) *Higher Education and the New Professionalism for Teachers. Realising the Potential of Partnership* London: The Higher Education Funding Council for England, the Committee of Vice-Chancellors and Principals of UK Universities and the Standing Conference of Principals.

Furlong, J., Barton, L., Miles, S., Whiting, C. and Whitty, G. (2000) *Teacher Education in Transition* Buckingham: Open University Press.

Garrison, D., Anderson, T. (2003) *E-Learning in the 21st Century: A Framework for Research and Practice* London: RoutledgeFalmer.

Garrison, D., Anderson, T. & Archer, W. (2001) 'Critical thinking, cognitive presence and computer conferencing in distance education', *American Journal of Distance Education*, 15(1) 7-23. Available at: <http://www.atl.ualberta.ca/cmc/CTinTextEnvFinal.pdf> (accessed on 06.09.04).

Geertz, C. (1983) *Local Knowledge: Further Essays in Interpretive Anthropology* New York: Basic Books.

Grunberg, J. and Armellini, A. (2005) 'Talking about teaching: a study of the professional uses of email by secondary school teachers in Uruguay', *Technology, Pedagogy and Education* (14)2 171-188.

Grunberg, J. and Armellini, A. (2004) 'Teacher collegiality and electronic communication: a study of the collaborative uses of email by secondary school teachers in Uruguay', *British Journal of Educational Technology* 35(5) 597-606.

Haberman, M. (2004) 'Can star teachers create learning communities?' *Educational Leadership* May 2004 52-56.

Hammersley, M. (1992) *What's Wrong with Ethnography?* London: Routledge.

Harasim, L. (1990) 'Online education: an environment for collaboration and intellectual amplification', in L. Harasim (ed) *Online Education: Perspectives on a New Environment* New York: Praeger Publishers.

Harasim, L. (2000) 'Shift happens. Online education as a new paradigm in learning', *The Internet and Higher Education* (3) 41-61.

Higher Education Funding Council for England, Joint Information Services Committee and the Higher Education Academy (2005) *HEFCE strategy for e-learning* London: Higher Education Funding Council for England.

Hill, J. (1996) 'Psychological sense of community: suggestions for future research', *Journal of Community Psychology* 25(4) 431-438.

Hirst, P. (1996) 'The demands of professional practice and preparation for teachers', in J. Furlong and R. Smith (eds) *The Role of Higher Education in Initial Teacher Training* London: Kogan Page.

Hoffmann, C. (2001) *Introduction to Sociometry*. Available at:
<http://www.hoopandtree.org/sociometry.htm> (accessed on 18.06.04).

Holsti, O. (1969) *Content analysis for the social sciences and humanities* Don Mills: Addison-Wesley Publishing Company.

Honey, P. and Mumford, A. (1986) *The Manual of Learning Styles* Maidenhead: P. Honey.

Hoyle, E. (1974) 'Professionalism, professionalism and control in teaching', *London Education Review* 3(2) 13-19.

Hoyle, E. (1980) *World Yearbook of Education. Professional Development of Teachers* London: Kogan Page.

Hutchings, P. and Shulman, L. (1999) 'The scholarship of teaching. New elaborations, new developments', *Change* 31(5) 10-15. Available at:
<http://www.carnegiefoundation.org/eLibrary/docs/sotl1999.htm> (Accessed on 03.06.03).

Hymes, D. (1994) 'Towards ethnographies of communication', in J. Maybin (ed) *Language and Literacy in Social Practice* Clevedon: Multilingual Matters/Open University.

Johns-Shepherd, L. and Gowing, E. (2007) 'Beyond the classroom door, beyond the school gates: the imperative for school-to-school networks for professional learning', in J. Pickering, C. Daly and N. Pachler (eds) *New Designs for Teachers' Professional Learning* London: Bedford Way papers.

Joint Information Systems Committee (2005) *Understanding my learning* JISC. Available at: <http://www.jisc.ac.uk/> (accessed on 10.08.06).

Jones, C. (2008) 'Networked Learning – a social practice perspective' *Proceedings of the 6th International Conference on Networked Learning*, Halkidiki, Greece. 616-623.

Jones, R. (2002) 'The problem of context in computer mediated communication'. Paper presented at the Georgetown Roundtable on Language and Linguistics, March 7-9 2002. Available at:
<http://personal.cityu.edu.hk/~enrodney/Research/ContextCMC.doc>. (accessed on 12.06.04).

Jones, C., Ferreday, D. and Hodgson, V. (2008) 'Networked learning a relational approach: weak and strong ties' *Journal of Computer Assisted Learning* 24 90-102.

Ketelhut, D., McCloskey, E., Dede, C., Breit, L. and Whitehouse, P. (2006) 'Core tensions in the evolution of online teacher professional development', in C. Dede (ed) *Online Professional Development for Teachers* Cambridge, MA: Harvard Education Press.

Koehler, M., Mishra, P., Hershey, K. and Peruski, L. (2004) 'With a little help from your students: a new model for faculty development and online course design', *Journal of Technology and Teacher Education* 12(1) 25-55.

Kolb, D. (1984) *Experiential Learning: experience as the source of learning and development* Second Edition, Englewood Cliffs New Jersey: Prentice-Hall.

Koschmann, T. (2003) 'CSCL, argumentation, and Deweyan inquiry: argumentation is learning', in J. Andriessen, M. Baker, and D. Suthers (eds) *Arguing to Learn. Confronting Cognitions in Computer-supported Collaborative Learning Environments* Dordrecht: Kluwer Academic Publishers.

Kress, G. (2003) *Literacy in the New Media Age* London: Routledge.

Kroll, B. (1981) 'Developmental relationships between speaking and writing', in B. Kroll and R. Vann (eds) *Exploring Speaking-writing Relationships: Connections and Contrasts* Urbana: National Council of Teachers of English.

Lamy, M. and Goodfellow, R. (1999) "“Reflective conversation” in the virtual language classroom', *Language Learning and Technology* 2(2) 43-61.

Lanham, A. (1993) *The Electronic Word: Democracy, Technology and the Arts* Chicago: University of Chicago Press.

Lapadat, J. (2000) 'Tracking conceptual change: an indicator of online learning', International Online Conference on Teaching Online in Higher Education. Available at: <http://as1.ipfw.edu/2000tohc/papers/lapadat.htm> (accessed on 06.09.03).

Lapadat, J. (2002) 'Written interaction: a key component in online learning', *Journal of Computer-Mediated Communication* 7(4), article 5. Available at: <http://www.ascusc.org/jcmc/vol7/issue4/lapadat.html> (accessed on 03.06.03).

Laurillard, D. (2002) *Rethinking University Teaching: A Conversational Framework for the Effective Use of Learning Technologies* London: RoutledgeFalmer.

Laurillard, D., Stratfold, M., Luckin, R., Plowman, L. and Taylor, J. (2000) 'Affordances for learning in a non-linear narrative medium', *Journal of Interactive Media in Education* 2. Available at: <http://www-jime.open.ac.uk/00/2/laurillard-00-2.pdf> (accessed on 06.09.03).

Lave, J. and Wenger, E. (1991) *Situated Learning: Legitimate Peripheral Participation* Cambridge: Cambridge University Press.

Lea, M. (2000) 'Computer conferencing: new possibilities for writing and learning in higher education', in M. Lea and B. Stierer (eds) *Student Writing in Higher Education: New Contexts* Buckingham: Open University Press.

Levy, P. (2006) "Living" theory: a pedagogical framework for process support in networked learning', *Association for Learning Technology Journal: Research in Learning Technology* 14(3) 225-240.

Lingard, B., Hayes, D., Mills, M. and Christie, P. (2003) *Leading Learning* Maidenhead: Open University Press.

Lingard, B., Ladwig, J., Mills, M., Bahr, M., Chant, D., Warry, M., Ailwood, J., Capeness, R., Christie, P., Gore, J., Hayes, D. and Luke, A. (2001) *The Queensland School Reform Longitudinal Study* Brisbane: Education Queensland.

Luckin, R., Plowman, L., Laurillard, D., Stratford, M., Taylor, J. and Corben, S. (2001) 'Narrative evolution: learning from students' talk about species variation', *International Journal of Artificial Intelligence in Education* 12. Available at: http://aied.inf.ed.ac.uk/members01/archive/vol_12/luckin/paper.pdf (accessed on 05.08.06).

Lyotard, F. (1984) *The Postmodern Condition: A Report on Knowledge* Manchester University Press.

McConnell, D. (2000) *Implementing Computer Supported Cooperative Learning* London: Kogan Page.

McConnell, D. (2006) *E-Learning Groups and Communities* Maidenhead: Open University Press.

MacGilchrist, B., Myers, K. and Reed, J. (1997) *The Intelligent School* London: Paul Chapman Publishing.

McGorry, S. (2003) 'Measuring quality in online programs', *The Internet and Higher Education* 6 159 –177.

McLoughlin, C. and Luca, J. (2000) 'Cognitive engagement and higher order thinking through computer conferencing: we know why but do we know how?' in A. Herrmann and M. Kulski (eds) *Flexible Futures in Tertiary Teaching*. Proceedings of the 9th Annual Teaching Learning Forum, 2-4 February 2000. Perth: Curtin University of Technology. Available at: <http://lsn.curtin.edu.au/tlf/tlf2000/mcloughlin.html> (accessed on 06.09.03).

Mahony, P. and Hextall, I. (2000) *Reconstructing Teaching: Standards, Performance and Accountability* London: Routledge.

Mayhew, B. and Levinger, R. (1976) 'Size and density of interaction in human aggregates', *American Journal of Sociology* 82 86-110.

Mercer, N. (1995) *The Guided Construction of Knowledge* Clevedon: Multilingual Matters.

Moore, A. (2004) *The Good Teacher* London: RoutledgeFalmer.

Moore, A., Edwards, G., Halpin, D. and George, R. (2002) 'Compliance, Resistance and Pragmatism: the (re)construction of schoolteacher identities in a period of intensive educational reform', *British Educational Research Journal* 28(4) 551-566.

Moran, C. and Hawisher, G. (1998) 'The rhetorics and languages of electronic mail', in I. Synder (ed) *Page to Screen* London: Routledge.

Moreno, J. (1960) *The Sociometry Reader* Glencoe, Illinois: The Free Press.

National Educational Research Forum (2001) *A Research and Development Strategy for Education: Developing Quality and Diversity* Nottingham: National Educational Research Forum.

Oliver, M. (2003) 'Looking backwards, looking forwards: an overview, some conclusions and an agenda', in J. Seale (ed) *Learning Technology in Transition* Lisse: Swets & Zeitlinger.

Olson, D. (1994) *The World on Paper: the Conceptual and Cognitive Implications of Writing and Reading* Cambridge: Cambridge University Press.

Ong, W. (1982) *Orality and Literacy* London: Methuen.

Pachler, N. (2007) 'Teacher development: a question(ing) of professionalism', in J. Pickering, C. Daly and N. Pachler (eds.) *New Designs for Teachers' Professional Learning* London: Bedford Way Papers.

Pachler, N. and Daly, C. (2005) 'Online communities and professional teacher learning: affordances and challenges', in E. Sorensen and D. Murchú (eds) *Enhancing Learning through Technology* Hershey, Pennsylvania: Idea Group, Inc.

Pachler, N. and Daly (2006) 'Professional teacher learning in virtual environments', *E-Learning* 3(1) 63-75.

Parcell, M. and Duke-Yonge, J. (2007) 'Virtual communities of inquiry: an argument for their necessity and advice for their creation', *E-Learning* 4(2) 181- 193.

Pickering, J. (2007) 'Teachers' professional development: not whether or what, but how', in J. Pickering, C. Daly and N. Pachler (eds) *New Designs for Teachers' Professional Learning* London: Bedford Way Papers.

Polkinghorne, D. (1988) *Narrative Knowing and the Human Sciences* New York: State University of New York Press.

Preece, J., and Malone-Krichmar, D. (2005) 'Online communities: design, theory, and practice', *Journal of Computer-Mediated Communication* 10(4), article 1. Available at: <http://jcmc.indiana.edu/vol10/issue4/preece.html> (accessed on 13.07.06).

Ramsden, P. (1998) *Learning to Lead in Higher Education* London: Routledge.

Reeves, J., Turner, E., Morris, B. and Forde, C. (2005) 'Changing their minds: the social dynamics of school leaders' learning', *Cambridge Journal of Education* 35(2) 253-274.

Rheingold, H. (1991) *Virtual Reality* New York: Summit Books.

Rice, R. (1992) 'Towards a broader conception of scholarship: the American context', in T. Whitson and R. Gieger (eds) *Research and Higher Education: The United Kingdom and the United States* Buckingham: Open University/ Society for Research into Higher Education Press.

Robertson, S., Shortis, T., Todman, N., John, P. and Dale, R. (2005). 'ICT in the classroom. The pedagogical challenge of respatialisation and reregulation', in M. Olszen (ed) *Culture and Learning: Access and Opportunity in the Classroom* Greenwich, Connecticut: Information Age Publishing.

Roschelle, J. (1992) 'Learning by collaborating: convergent conceptual change', *Journal of the Learning Sciences* 2(3) 235-276.

Rourke, L. and Kanuka, H. (2007) 'Barriers to online critical discourse', *Computer-Supported Collaborative Learning* 2(1) 105-218.

Rovai, A. (2002) 'Building a sense of community at a distance', *International Review of Research in Open and Distance Learning* 3(1), article 5. Available at: <http://www.irrodl.org/index.php/irrodl/article/view/79/153> (accessed on 11.06. 04).

Rovai, A. (2003) 'A practical framework for evaluating online distance education programmes', *The Internet and Higher Education* 6 109-124.

Rüschoff, B. and Ritter, M. (2001) 'Technology-enhanced language learning: construction of knowledge and template-based learning in the foreign language classroom', *Computer Assisted Language Learning* 14(3-4) 219-32.

Sachs, J. (2003a) *The Activist Teaching Profession* Buckingham: Open University Press.

Sachs, J. (2003b) *Teacher Activism: Mobilising the Profession*. Plenary address, British Educational Research Association Conference, Edinburgh, 2003.

Salmon, G. (2000) *E-moderating: the Key to Teaching and Learning Online* London: Kogan Page.

Salmon, G. (2004) *E-tivities: the Key to Active Online Learning* London: RoutledgeFalmer.

Santos, I. and Hammond, M. (2006) 'What is an online learning community?' Paper presented at the British Educational Research Association Conference, University of Warwick, September 2006.

Saunders, L. (2004) 'Doing things differently?' *Teacher Development* 8 (2&3)117-126.

Schön, D. (1983) *The Reflective Practitioner* London: Temple Smith.

Schön, D. (1987) *Educating the Reflective Practitioner* New York: Basic Books.

Schostak, J. (2002) *Understanding, Designing and Conducting Qualitative Research in Education* Buckingham: Open University Press.

Schwienhorst, K. (2002) 'Why virtual, why environments? Implementing virtual reality concepts in computer-assisted language learning', *Simulation and Gaming* 33(2) 196-209.

Schwienhorst, K. (2003) 'Neither here nor there? Learner autonomy and intercultural factors in CALL environments', in D. Palfreyman and R. Smith (eds) *Learner Autonomy Across Cultures* Basingstoke: Palgrave Macmillan.

Scott, J. (2000) *Social Network Analysis: A Handbook* London: Sage.

Seale, J. (2003) *Learning Technology in Transition* Lisse: Swets & Zeitlinger.

Sergiovanni, T. (1999) 'The story of community', in J. Retallick., B. Cocklin. and K. Coombe (eds) *Learning Communities in Education* London: Routledge.

Sharples, M. (2007) 'An Interactional Model of Context'. Presentation at the Philosophy of Technology-Enhanced Learning seminar, 29 June 2007, London Knowledge Lab.

Shulman, L. (1986) 'Those who understand: knowledge growth in teaching' *Educational Researcher* 15(2).

Shulman, L. (1996) 'Just in case: reflections on learning from experience', in J. Colbert, K. Trimble and P. Desberry (eds) *The Case for Education: Contemporary Approaches for Using Case Methods* Boston: Allyn Bacon.

Smith, B. (2003) 'Computer-mediated negotiated interaction: an expanded model', *The Modern Language Journal* 87(i) 38-54.

Smithers, A. and Robinson, P. (2001) *Teachers Leaving* London: National Union of Teachers.

Smithers, A. and Robinson, P. (2004) *Teacher Turnover, Wastage and Destinations* London: Department for Education and Skills.

Snyder, I. (1998) *Page to Screen* London: Routledge.

Snyder, I. (2002) *Silicon Literacies: Communication, Innovation and Education in the Electronic Age* London: Routledge.

Somekh, B. and Pearson, M. (2002) 'Intercultural learning arising from pan-European collaboration: a community of practice with a hole in the middle', *British Educational Research Journal* 28(4) 485-502.

Stahl, G. (2006) *Group Cognition: Computer Support for Building Collaborative Knowledge* Cambridge, MA: MIT Press.

Stake, R. (1995) *The Art of Case Study Research* Thousand Oaks: Sage.

Standish, P. (2002) 'Euphoria, dystopia and practice today', *Educational Philosophy and Theory* 34(4) 407-412.

Standish, P. (2007) 'Customer satisfaction and the economy of context'. Paper presented at the Philosophy of Technology-Enhanced Learning seminar, 29 June 2007, London Knowledge Lab.

Stoll, L., Fink, D. and Earl, L. (2003) *It's About Learning (and It's About Time)* London: RoutledgeFalmer

Strauss, P. (1995) 'No easy answers: the dilemmas and challenges of teacher research', *Educational Action Research* 3(1) 29-39.

Suthers, D. (2005) 'Technology affordances for intersubjective learning: a thematic agenda for CSCL', in T. Koschmann, D. Suthers and T. Chan (eds) *Computer Supported Collaborative Learning 005: The Next 10 Years!* Mahwah, New Jersey: Lawrence Erlbaum Associates.

Training and Development Agency (2005) *Postgraduate Professional Development Programme*. Available at: <http://www.tda.gov.uk/partners/ppd.aspx> (accessed on 03.11.06).

Training and Development Agency (2006) *Teachers' Professional Standards*. Available at: <http://www.tda.gov.uk/teachers/professionalstandards.aspx> (accessed on 03.10.07).

Tripp, D. (1993) *Critical Incidents in Teaching: Developing Professional Judgement* London: Routledge.

Turoff, M., Hiltz, S., Bieber, M., Fjermestad, J. and Rana, A. (1999) 'Collaborative discourse structures in computer mediated group communications', *Journal of Computer-Mediated Communication* 4(4), article 4. Available at: <http://www.ascusc.org/jcmc/vol4/issue4/turoff.html> (accessed on 30.06.04).

Veerman, A., Andriessen, J. and Kanselaar, G. (2000) 'Learning through synchronous electronic discussion', *Computers & Education* 34(3-4) 269-290.

Vygotsky, L. (1986) *Thought and Language* Cambridge, MA: MIT Press.

Warschauer, M. (1999) *Electronic Literacies. Language, Culture and Power in Online Education* Lawrence Erlbaum Associates.

Watkins, C., Carnell, E., Lodge, C., Wagner, P. and Whalley, C. (2002) 'Effective Learning', National School Improvement Network *Research Matters* 17, Summer 2002.

Webb, M., Pachler, N., Mitchell, H. and Herrington, M. (2007) 'Towards a pedagogy of mentor education', *Journal of In-service Education* 33(2) 171-188.

Wenger, E. (1998) *Communities of Practice: Learning, Meaning and Identity* Cambridge: Cambridge University Press.

Wilkinson, D. (2000) *The Researcher's Toolkit: The Complete Guide to Practitioner Research* London: Routledge.

Wood, D., Bruner, J., and Ross, G. (1976) 'The role of tutoring in problem-solving', *Journal of Child Psychology and Child Psychiatry* 17 89-100.

Wrigley, T. (2004) "School effectiveness": the problem of reductionism', *British Educational Research Journal* 30(2) 227-244.

Yandell, J. and Turvey, A. (2007) 'Standards or communities of practice?' *British Educational Research Journal* 33(4) 533-550.

APPENDIX I: Example of the units of analysis

Messages 1-3 from Discussion 2 as units of analysis, with responses 1-10 nested within.

MESSAGE 1 from Sally

Mon Dec 2, 2002 8:36 pm

RESPONSE 1

Response to Dave

I agreed strongly with the points that you were making about Sullivan's piece of research not fitting into the Brooker and McPherson checklist about what makes good research. I have recently read a book based on work done in a kindergarten class in America by it's author, Vivian Gussin Paley which is highly reflective and from what I can remember would not fit into the above checklist, but none the less has changed the way that I teach story telling in my classroom. (Of course it helped that I attended a training course that told me about the book in the first place or I wouldn't have known of it's existence!)

In response to your comment about how we actually teach, there has also been a huge push in primary schools recently on accelerated learning which goes someway to addressing the question about "how we teach" (or rather how children learn) as opposed to what we teach. This could be a reflection on the way that primary schools work compared to secondary, ie. processes v. product.

MESSAGE 2 from Linda

Tue Dec 3, 2002 12:50 pm

I sat and read everybody's postings all in one go and so if the comments I make jump around a bit I apologise, but these were all the things that interested me as I went through.

RESPONSE 2

In response to Dave I agree that the support and development during the NQT year is now structured very well, but then it seems to stop, perhaps this course is a progression of the sort that I think would be valuable, but that is only for a few people. Once qualified, we

tend to then think of teachers as getting on with it, INSET and various courses are available, but mine over recent years have all been very practical things like new examination courses, and we are only allowed to attend one a year. One possibility as mentioned is that department meetings should be much more philosophical, not all about practicalities and paper exercises but about talking and developing teaching and learning strategies and looking at examples of good educational research.

RESPONSE 3

This would be met by some however with resistance. This point was made well by Greg when he talked of "troopers", he was referring to different types of teachers, those that were open to the possibility of change and those that were not, not out of real philosophical opposition however, but just because they couldn't be bothered.

RESPONSE 4

I would like to think that I am not one of those teachers that can't be bothered to do things, but on the other hand, I know that I do still spend a lot of time feeling how Mike described; "getting through rather than doing the job well" Is this because there really is too much to get done in a limited space of time?

RESPONSE 5

This all brought me back to thinking about the original piece of research I studied, "maths and teaching pupils to write better explanations", In the end I actually felt like I had missed an obvious point. I had originally thought this was very useful research but then I was shocked that I hadn't spotted what DaveboyG (sorry cant remember who you really are) (ANGELIQUE) had. Your conclusion was spot on, the research proved that if you spend all your time teaching pupils how to do a very focused skill, then they will get better at it. I don't like to be negative and cynical but, I think although the layout and technical side of the research was clear, the usefulness of it is lessened because we already know if we target a specific area we could achieve improvements.

MESSAGE 3 from Mary

Tue Dec 3, 2002 3:46 pm

RESPONSE 6

Response to Joyce: I actually quite like the fact that John Sullivan highlights the 'ills in teaching' as I feel akin to him - as if he is truly 'one of us' and thus really understands what we experience in a day. And despite his objectives being unclear, I do wonder if it really matters. We are not, currently, discussing the problems of disseminating and accessing research therefore, with those issues removed, I think that his work might be valuable to many.

Several people mentioned that Maureen Loomes' piece appeared to be good research when applied to the checklist but perhaps the research have begun "I am going to prove that if children are taught something, they will know how to do it better."?!!! If it had, would it have been VERY good research with which we couldn't argue?

RESPONSE 7

Oscar says that "...a criticism of Loomes' work would be an unwillingness to explicitly address the applicability and utility of her research."

RESPONSE 8

And Neil agrees with " Surely a researcher should concentrate his/her research on a detailed investigation/explanation of how the findings can be applied and taken forward." but I am not sure, again, that this matters. Can a researcher always specifically predict the usefulness and pertinence of his/her work? Should we criticise a researcher for this absence? I doubt we would mind if the researcher stated an intention of applicability but the research was deemed useful in an additional area?

RESPONSE 9

Interestingly, Mike also feels, like myself, that the view of 'what is good research' has changed somewhat and the reflective texts are just as useful as 'boxed and measured' equivalents.

I have minor issues with the term 'fuzzy generalisation' but can't pinpoint why! Does anyone else feel like that?

RESPONSE 10

Annie states that it has become obvious to her that definite criteria are needed to assess research and that we, too, will need to follow strict guidelines when producing our research. I think Annie is right and it will be interesting to see how we are judged if we choose such a reflective approach!

I'm slightly bemused that this task appears so similar to the first and even more convinced that the age-old problem of 'time' remains a larger issue than it should (when mindful of the recent strike where, teachers in childless schools managed to get SO much work done in one day!).

Sorry for the miscellaneous collection of off-the-top-of-my-head comments!

APPENDIX II: The interview schedule

Name

Date

Gender		
Age		
Ethnicity		
School phase/subject		
Year of teaching		

A. Prior experience

QA1. Did you have any experience of studying online before joining the Master of Teaching Programme? If so, can you describe the features of that online experience?

QA2. Did you have any experience of online chat groups or web communities before joining the Master of Teaching? If so, can you describe the features of that online experience?

QA3. What were your reasons for applying to do the Master of Teaching?

QA4. What were your expectations about studying online?

QA5. What do you think influenced these expectations?

B. Participation

QB1. How important did you find it to get a response to your postings?

QB2. How did you choose the postings you responded to?

QB3. How did you react to the time-delay between the writing and the reading of participants' contributions and responses?

QB4. What do you think is the point of participation in online discussions in the Master of Teaching?

QB5. Could you give a description of what you think the tutor's role ought to be in online discussion?

QB6. What do you think about how much you are expected to participate in the Master of Teaching online discussions (compulsory task plus at least one response)?

QB7. What was your experience of working with a response partner?

C. Writing online

QC1. Did you feel confident in knowing how to write the postings to send to the online forum?

QC2. Did your style of writing change during the course of the discussions?

QC3. Can you describe the style in which you wrote your contributions to the discussion?

D. Community

QD1. Do you think of your tutor group as an online community?

QD2. What, if anything, did the online discussions reveal to you about teachers' shared concerns and experiences?

QD3. Did you discuss anything online which you would not normally talk about with school colleagues?

QD4. What do you think are the features of an online community?

QD5. Which of these features did your tutor group have or not have?

E. Learning

QE1. In the Leading Learning module we tried to achieve these aims and objectives (show Sheet A). How well do you think we achieved these?

QE2. Could you please give a description of the learning that you think was going on in the online discussions you were part of?

QE3. How, if at all, did the online discussions support your learning in the modules?

3.1 Did it support your understanding of the issues?

3.2 Did it support your understanding of the reading material?

QE4. How, if at all, did the online discussion support your learning beyond the work for the modules?

QE5. What have been the challenges of learning as part of an online tutor group?

QE6. What have been the benefits of learning as part of an online tutor group?

F. Professionalism

QF1. What do you understand by the term professional?

QF2. Have the online discussions affected in any way how you think about professionalism?

QF3. Have the online discussions had any effect on how you think about yourself as a professional?

Sheet A

Master of Teaching: Leading Learning Aims and Objectives

As stated in the Master of Teaching handbook, the principle aims and objectives of this module are:

Aims:

To develop participants:

- understanding of 'learning' and 'leadership' as complex concepts
- critical awareness of the impact of contemporary contexts on professional learning
- enthusiasm for innovative practices in teaching and learning for pupils and teachers
- reflection on 'effectiveness' and 'improvement' agendas for learning in schools
- commitment to learning in networked contexts
- understanding of 'practitioner capacity', including the role of scholarly approaches to teacher development

Objectives:

- to develop participants' subject knowledge about learning in terms of classroom processes and transformations
- to develop 'storying' and 'narrative' as professional learning strategies
- to equip participants to initiate, conduct, review and disseminate innovative professional practice in shared contexts
- to deepen understanding of the potential of schools as professional learning communities

APPENDIX III: The pilot derivation of categories and indicators for qualitative content analysis

Knowledge construction

Learning is viewed as both a product of social activity and is at the same time the process by which meaning is made in communion with others. A socio-cultural version of constructivism, most frequently adopted within CMC pedagogical design, posits knowledge as a social construct (Laurillard, 2002). That which is ‘known’ is that which carries a shared orientation towards its meaning, arrived at through collaborative processes which are conducted through language. Vygotskian views on concept formation centre on the ‘significative use’ of language, which is prompted ‘not from within but from without, by the social milieu’ (1986, p.108). Theories of knowledge construction have taken as a premise that coming to ‘know’ something is not an act of individual cognition alone, but is a process of engaging in the social world and mediating the sense that is made of it through some form of sign which is communicable to others. Discourse is analysed for its role as catalyst in the interplay between the individual and the social, the private world and the public as a means of constructing knowledge. In the text-based asynchronous environment, narrative is the means by which teachers account for their professional actions, and present themselves as actors within a peer context. Literate behaviours for learning centre around participation in textual ‘thinking’ through: augmentation, peer learning, adaptation and modification of expressed ideas. Lapadat (2002) has based her arguments for the constructivist properties of asynchronous CMC on such literate behaviours being facilitated by the online environment, describing the participants as ‘*conversationalists*’. Her argument is that writing online is the participatory core of CMC, as it facilitates constructivist approaches to meaning-making (2000, 2002). Indicators of knowledge construction through social interactive processes are derived from Mercer’s (1995) ‘sketch’ of the nature of learning through language interaction in constructivist contexts, “This is a social, historical process, ...so that the knowledge that is created carries with it echoes of the conversations in which it was generated” (p. 84). **The indicators include ‘echoing’ properties: reassessments, new ideas/proposals, questions, endorsements/verified ideas and modified ideas.**

Community

Wenger (1998) makes it clear that a *community* does not necessarily imply a shared *practice*, and it is in the relations with practice that the core relevance to teachers' learning lies. Wenger's concept of a community of practice (COP) links the aspects of 'community' with 'practice' as a collaborative learning enterprise, offering a way of understanding professional learning from the 'inside out', as an alternative to the reductive frameworks for learning about practice in which teachers currently operate. The COP emphasises 'a way of talking', a communicative function of community which establishes the meaning of what people do, and enables them to take future actions. Researchers now consider the nature of relationships between individuals to be more indicative of the existence of community than physical proximity (Preece and Maloney-Krichmar, 2005). The distinguishing point about a COP as a metaphor for an electronic discourse community, lies in the potential of CMC to support the possibilities of agency brought about by individuals engaging in constructivist approaches to learning about practice. Within Wenger's conceptualisation, learning is premised on constructivist ideas which have become marginalised within discourses of teaching in recent years. Teachers do not ordinarily engage in collaborative approaches to knowledge construction in their professional learning. For community to be relevant as a core element of learning as participatory narrative, there needs to be a sense of common purpose and satisfaction of needs through active participation (Rovai, 2002). One of Rovai's criteria for a 'sense of community' is having common expectations of learning, citing Lave and Wenger's (1991) assertion that within communities of practice, learning is considered "an integral and inseparable aspect of social practice" (p.31). **The indicators for the category of 'community' are: shared values/goals, giving/seeking support, mutuality and practice-based exchanges.**

Metalearning

Agentive and reflexive paradigms of teachers' professional learning draw on the development of metalearning capabilities in teachers (Sachs, 2003a; Lingard et al., 2003; Furlong, 2000). The notion of the 'activist professional' depends on metalearning which enables teacher-identity to be complex and multiple. Ways of becoming reflexive are based

on teachers' narrating, historicising, and critically deconstructing at a meta-level how they act in order to understand themselves and their practice within the social and political conditions which bear on those actions. Moore's analysis (2004) of dominant discourses of teaching suggests that the potential for agency (and thus 'hope') lies where teachers engage in an alternative way of constructing the professional self, by adopting the 'reflexive turn' (p.141). The reflexive turn is an agentive factor in teacher learning, where it develops the discourse of the 'reflective practitioner' away from the self-referring and inward-looking solo-performative connotations it bears, and takes reflection to another level. Reflexive practice should be "authentically and constructively critical...challenging rather than confirmatory" (p.142) and is rooted in the construction of continually evolving identities which are based on understanding the teacher as a person whose practice is continually developing based on their history as a social and intellectual being. **The indicators for the category 'metalearning' are: verbalising the learning process, verbalising consciousness of understanding and verbalising consciousness of difficulties.**

Autobiography

Shared narrative as a cognitive process that organizes human experiences into 'temporarily meaningful episodes' (Polkinghorne, 1988, p.1) has informed the view of teacher narrative as arising from and constituting 'critical episodes' (Tripp, 1993) and having a vital role in enabling teachers to challenge orthodox, universal 'truths' which govern their practice (Clandinin and Connelly, 2000). Here, narrative *function* contributes to teachers' learning by the ways in which subjectivities are constructed through the 'telling' of experience from professional life. Our interest lies in the 'verisimilitude' of such narratives of experience, which cognitive psychologist Bruner argues are constructed by individuals to organise their experiences in order to make sense of them (Bruner, 1985). This function of narrative we see as supported by peer interaction online over time. CMC in the MTeach helps participants to develop deeper professional meanings, which are co-constructed, based on a range of narratives which they tell online, in which they recount critical episodes, offer personal retrospectives and reflection and 'story' their teacher and learner identities within the contexts of the actions which have helped to shaped them. **These form the indicators**

for the category ‘community’: critical incidents, personal reflection, teacher identity and learner identity.

Cognition

A central issue is the relationship between individual meanings and the shared social contexts within which knowledge is situated: “While knowledge is a social artefact, in an educational context, it is the individual learner who must grasp its meaning or offer an improved understanding” (Garrison and Anderson, 2003, pp.12-13). Alternative emphasis is made by Koschmann (2003) who asserts that there needs to be a theory of learning through CMC that embraces cognition as rooted in various forms of social relations, which he terms ‘social conflict’, ‘social practice’ and ‘distributed cognition’.

An emphasis on indicators of ‘cognitive presence’ emphasises ‘phases’ in cognition (see Garrison et al., 2001, p. 11) by which the online learning process can be described in relation to sequential phases of critical thinking. Such a linear process model of cognitive growth however, does not address the possibility of multiple and co-existing *forms* of cognition, which for teachers’ professional learning seem characteristic to the complex relations between what they know and how they identify themselves as teachers.

Some constructivist theories of learning within new technologies have emphasised ‘epistemic conflict’ or the clash of differing opinions and ideas as a core element (Harasim, 2000; Koschmann, 2003). In this ‘social conflict’ view, interaction based on conflict is posited as having a causal effect on cognition, although the link between the conflict model of social relations and cognitive transformation is not clear, but implies an accommodation or adaptation by the individual brought about by the social relations of conflict. In the transcripts analysed here, there was no manifest evidence of conflict like this, and so this variable has not been included in the coding. The reasons for this absence are unclear, but it may be that the mutuality of the teachers may be conditioned by common notions of professionalism to a greater extent than other types of online learning communities. The indicators for the category ‘cognition’ are drawn from analyses of professional teacher learning, Moore’s analysis (2004) of the development of the ‘reflective turn’ and Lingard et al.’s concept (2003) of what teachers need to learn to enact ‘productive pedagogies’, which

have an agentive dimension and counter-reductivist orientation. **They are therefore the following: developing understanding – theoretical, critical and practical, and learning from others.**

APPENDIX IV Adjacency matrices for maps 2 and 3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Indegree (Total lines received)
1		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0		0	0	0	0	1	0	1	1	0	0	1	0	0	4
3	0	0		0	0	0	0	0	0	0	0	1	0	0	0	1
4	0	0	0		1	0	0	1	0	0	0	1	0	0	0	3
5	0	0	1	0		0	0	1	0	0	0	0	0	0	0	2
6	0	0	0	0	1		0	0	0	0	0	0	0	1	0	2
7	1	0	1	0	1	0		0	0	1	0	0	0	0	0	4
8	1	0	1	1	0	0	1		0	1	0	0	0	0	1	6
9	0	0	0	0	0	0	0	0		0	0	1	0	0	0	1
10	0	0	1	0	0	0	0	0	0		0	0	0	1	0	2
11	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0
12	0	1	0	0	1	0	0	0	0	0	0		0	0	0	2
13	0	0	0	0	0	0	1	0	0	0	0	0		0	1	2
14	0	0	0	0	1	0	0	0	0	0	0	0	0		0	1
15	0	0	0	0	0	0	0	0	0	1	0	1	0	0		2
Outdegree (Total lines sent)	2	1	4	1	5	0	3	2	1	4	0	4	1	2	2	32

Adjacency matrix for map 2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Indegree (Total lines received)
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	3
3	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	4
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	1	0	0	0	1t	1	1	1	0	0	0	0	0	4+1t(=5)
6	0	0	1	0	0	0	0	1	0	0	0	1	0	1	1	5
7	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	2
8	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	1s	0	0	0	1s	0	0	1s	1s		1s	0	0	1s	1s	0+7s(=7)
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	1	0	0	0	0	1t	0	0	0	0	0	1		0	2+1t(=3)
15	0	0	1	0	0	0	0	0	0	0	0	1	0	0		2
Outdegree (Total lines sent)	1	1	4	0	4	0	1	4	2	2	2	3	1	4	3	32

Adjacency matrix for map 3

APPENDIX V Coding table for 'meta-level engagement' from transcript 3

Indicators for Meta-level engagement	Textual content
Discussing own and others' learning (e)	<p>3Me#1. I have just spent an hour reading through the postings and trying to think of the angle from which to write my reply, the biggest ongoing line of thought running through was always the issue of time, and so i decided to think about how this problem could be addressed.</p> <p>3Me#2. I agree that as MTcg [MTeach] students we can cast a more 'discerning eye' over 'research' with developing confidence. I personally would not accept 'research' at face value now and find the Brooker and Macpherson Framework a useful 'point of reference'.</p> <p>3Me#3. Having read all of the task responses, there are a huge amount of interesting opinions of which one could debate for hours.</p> <p>3Me#4. Having read all of the discussions and the responses so far, it was clear to see that many of us agree; as a profession, teachers should be research literate! However, many discussions expressed an empathy with those who choose not to be research literate, either through lack of time or the very nature of academia!</p> <p>3Me#5. <i>Angelique's final comment about our discussions being a 'journey' highlights the luxury of being able to consider and reflect on not only our own views but those of the whole group. This course is providing us with the opportunity, (and probably forcing us to make time), to do this and I agree it is proving a very positive experience.</i></p> <p>3Me#6. Mary's concluding comment about 'how useful research would be!' made me consider the importance of contemplating and discussing the 'why's' of new initiatives rather than, as is usually the case, the 'how's'.</p>

Reconsidering views (f)	3Mf#1. Initially Oscar's arguments seemed a little harsh (commented on by a few members in their responses), but on reflection I tend to agree with a range of the points put forward.
-------------------------	--

	<p>Research is perceived as being an area out of 'our domain' an area we touch upon incidentally and for short periods of time. Teachers I work with are both professional and reflective but wouldn't initiate finding or studying a piece of research only if it had been presented to them or on the form of a report or magazine article (not because they are lazy or complacent but because they are tired and over worked).</p> <p>3Me#2. I also, was initially quite surprised at Oscar's remark that there are no persuasive arguments to convince teachers that they need to be research literate. Actually, I think he's probably right in that many teachers accept the idea that they should be as part of being professionally competent.</p> <p>3Me#3. Linda's idea of a School Research Coordinator at first I thought was a bit too idealistic and possibly unnecessary but the more I thought about it the more it seemed like a good idea especially in a larger school (where there may be greater funding available). It could help all teachers to do their job well. I imagine that such a post would only arise in a school where becoming research literate as part of our professional development was a given a high priority. However if it becomes clear that those schools who recognize "the potential of research as part of teachers' professional development" are in fact successful schools then more schools will have School Research Coordinator posts!</p>
--	---

Creating what if/ hypothetical scenarios (g)	<p>3Mg#1. Here could be the possible facts for a school that wanted to really push this [research literacy] as an idea:</p> <p>JOB OPPORTUNITY +1 - SCHOOL RESEARCH CO-ORDINATOR</p> <p>The suitable applicant for the post will need to have a genuine interest in this area and will need to do the following tasks</p> <ol style="list-style-type: none"> 1. create an area/noticeboard in the staffroom that would act as a library for books, newspapers and noticeboard for relevant articles to be displayed (enlist the help of any staff that do have a leaning towards reading good journals or papers or browse the internet to
--	--

help with selection of specific articles for display)

2. ask all staff through a questionnaire for any personal areas of interest, staff could then form groups for later ongoing discussion
3. produce some sort of thought for the week they may refer to a piece of research or a government policy, invite those who did want to attend to come to 30 minute "over lunch" discussion in the staff room (cakes normally gets people in, or better still hold it in the pub!)
4. Once a term, in twilight or meeting time, lead a time of reflection based on research, ideally that has been suggested by a numbers of staff
5. Feedback major issues to all staff through a research centred newsletter produced once or twice a year

To do that job 100% would be nearly impossible, but I think that applies to any responsibility points, I think however that a committed person could do that job and it be a fair workload for a point. What's a point worth? £1500? that is less than the research grants available that we ahve discussed so the governmnet could award the equivalent of one point to a school to pay someone to do that job

you may be thinking what a stupid idea, but i felt very much that I wanted to think of how could get research int o schools in a very practical way and they are the ideas I had

3Mg#2. Perhaps some of the more mundane administrative tasks could be taken out of the profession to make way for research. What about a similar situation for teachers as the surgeons? where after a number of years of service, teachers would have the opportunity to teach and conduct research in other schools. It would seem to me that not enough research findings are passed from other older teachers to younger teachers.

3Mg#3. I wonder if ITT providers might extend the current QTTs and build in a continuing research element for the NQT year? It could be assessed as part of the validation of the training year. That would start a process of expectation that all teachers 'extend their repertoire' by becoming research literate. Although this doesn't address the issue of time and/or desire to investigate educational research for qualified teachers, it IS a beginning!

